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AND NAVAL OPEN ARCHITECTURE: OPTIONS
TO FACILITATE SMALL-BUSINESS
PARTICIPATION IN THE DEPARTMENT OF THE NAVY**

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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

**AN ANALYSIS OF SMALL-BUSINESS CONCERNS AND
NAVAL OPEN ARCHITECTURE: OPTIONS TO
FACILITATE SMALL-BUSINESS PARTICIPATION IN
THE DEPARTMENT OF THE NAVY**

by

Christopher S. Bilinski

March 2013

Thesis Advisor:
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Thomas Housel
Glenn Cook

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ARCHITECTURE: OPTIONS TO FACILITATE SMALL-BUSINESS
PARTICIPATION IN THE DEPARTMENT OF THE NAVY**

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Lieutenant, United States Navy
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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN INFORMATION TECHNOLOGY MANAGEMENT

from the

**NAVAL POSTGRADUATE SCHOOL
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ABSTRACT

The open architecture strategy being utilized within the Department of the Navy (DON) has been built on a foundation that Naval Open Architecture (NOA) will provide an increase in competition, a decrease in costs and present an opportunity to maximize market innovation. The Small Business Concern (SBC) is often considered the catalyst to achieving these benefits. There have been mixed reviews of NOA and there is research to suggest that there are barriers to SBC participation in the DON market. Through NOA the DON would like to foster an environment that encourages the SBC to participate in the competition for DON contracts thus yielding benefit to the DON. However, there remain skeptics that assert that the DON is failing to maximize the benefit of SBC participation in DON markets due to barriers. The result of these real or perceived barriers limits SBC participation and as a result, the DON fails to benefit from a truly competitive process.

The purpose of this study is to better to understand the relationship between NOA and the role of the SBC in DON contracting. The goal of this study is to understand and provide options to the real or perceived barriers SBCs encounter in NOA.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADP	Advanced Data Processing
COTS	Commercial off the Shelf
DFARS	Defense Federal Acquisitions Regulations Supplement
DOA	Department of the Army
DOAF	Department of the Air Force
DoD	Department of Defense
DON	Department of the Navy
FAR	Federal Acquisitions Regulations
FED	Federal Government
FY	Fiscal Year
INC.	Incorporated
IT	Information Technology
NEC	National Economic Council
NOA	Naval Open Architecture
OA	Open Architecture
OSBP	Office of Small Business Programs
PM	Program Manager
PSC	Product Service Code
R&D	Research and Development
SBA	Small Business Act
SBC	Small Business Concern
SBIR	Small Business Innovative Research
TELECOM	Telecommunications

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I. INTRODUCTION

The Open Architecture (OA) strategy being applied within the Department of the Navy (DON) has been speculated to yield several benefits to the DON, including enhanced competition. OA has been viewed as one innovative tool for reducing costs (through greater efficiencies, enhanced competition, lower life-cycle cost, etc.) while creating and maintaining the needed flexibility to quickly respond to the ever-changing threat environment (Womble, Schmidt, Arendt, & Fain, 2011, p. 9). This research focuses on the real and perceived barriers that prevent the enhancement of competition by way of the small-business concern (SBC) in Naval Open Architecture (NOA) and options to facilitate SBC participation. SBCs, cannot participate in the defense arena due to risk suppression mechanisms and the exorbitant costs to enter the market (Cole, Housel, & Wolff, 2012, p. 89) . SBCs cannot afford to follow bureaucratic rules and restrictions imposed by the current acquisition process in the DoD (Cole et al., 2012, p. 89).

This study will substantiate or refute the claim that SBCs encounter barriers to enter DON markets through an understanding of DON contract award tendencies on data collected from Fiscal Year 2012 (FY12). Additionally, this research will examine what makes a company a recurring DON partner in various NOA and DON markets. The emphases on these points will be used to develop an understanding of the real SBC market. This understanding will be based on profiles of the recurring participants and the products or services awarded to various size companies across the entire DON market. Awards studied will focus on primary awards to both large and small businesses. Research will investigate and develop the options to facilitate SBC participation in the DON market through an analysis of existing DON FY12 award data and standing regulations. This research will describe the benefits of an increased association between the DON and SBCs to include a discussion of what NOA and DON markets benefit most from SBC participation.

A. PURPOSE

The purpose of this study is to better to understand the relationship between DON practices, NOA policy and the role SBCs play in the NOA and DON markets. The goal of this study is understand the real or perceived obstacles that the SBC encounters in the DON marketplace and to apply lessons learned to NOA and DON markets in an attempt to maximize the DON benefits of doing business with the SBC. Analyzing and understanding collected DON spending data will be used to construct options to facilitate an increase in SBC participation in the NOA and DON market. These options are necessary to overcome barriers that SBCs encounter upon consideration to enter NOA and DON markets. By understanding spending data, recurring awardee profiles and various primary and niche markets; SBCs will be better equipped to utilize options designed to facilitate participation and to capitalize on benefits that are offered by the SBC to the DON. In an effort to better understand the real or perceived DON barriers to competition and to encourage SBC participation thus maximizing the benefits of a DON and SBCs affiliation; a study of primary market data and potential options to facilitate SBC participation in the DON market place is required.

The DON will benefit from this research because the DON will have a better understanding of barriers (both real and perceived) the SBC is faced with upon participating in NOA and DON markets. The presentation of market data, along with company profiles will assist DON leadership in NOA and DON markets to maximize the participation and benefits associated with increased SBC participation. The analysis of data and options provided in this research will encourage the DON to change or stand fast on current NOA strategy when considering open competition and the role of the SBC in the NOA and DON markets.

B. BACKGROUND

One of the principles that NOA is founded upon is that it will increase competition when properly executed. The principle of increased competition is typically associated with benefits that allow the DON to capitalize on decreased costs and an increased opportunity for innovation. Many have determined that this opportunity should

be derived via the SBC. The SBC is presently providing the products and solutions needed to support Sailors and Marines, and can provide the innovations necessary to help solve life cycle sustainment and/or safety of life problems (Dussault, 2012, p. 13). This sentiment must be assumed to apply across all DON markets to include the NOA market.

There is currently no research that answers the question of how well NOA incorporates the SBC vs. how well the entire DON incorporates the SBC. To maximize the benefit of this study for the DON, research will determine whether the SBC provides the DON with an increased level of innovation (captured through intellectual property) upon award; as it is claimed by SBC supporters that SBCs make better use of their intellectual property. Perhaps the reason why SBCs are more successful innovators is due to its careful use of intellectual property (Cole S. , 2011, p. 20). These findings on intellectual property and innovation will reveal whether or not there is added innovation to be gained by the DON through the employment of the SBC vs. a typical large prime corporation. The argument that NOA must include or focus more attention and resources on the SBC will be rejected or accepted.

C. RESEARCH OBJECTIVES

NOA is designed to encourage competition and decrease costs through the leverage that DON creates when multiple contract providers are available for selection. Additionally, there are laws, instructions and strategic guidance to all federal agencies to encourage the participation of SBCs in federal markets (to include NOA and DON markets). As seen in law, *it is the declared policy of the Congress that the Government should aid, counsel, assist, and protect, insofar as is possible, the interests of small-business concerns in order to preserve free competitive enterprise* (Small Business Act, 2008). Or witnessed in strategy, a recent change in acquisition strategy is to encourage competition and collaboration through the introduction of SBCs into the acquisition ecosystem (Cole S. , 2011, p. 13). The combination of these two DON objectives to encourage competition and decrease cost creates the following compelling questions that the DON must consider:

- Where does the SBC best participate in DON contracting?
- Does NOA increase SBC participation?

The primary objective of this research will answer those questions.

The secondary objective of this thesis is to explore the SBC barriers to entry to NOA and DON markets and provide both the DON and SBC options to facilitate SBC participation. It has been documented in previous research that SBCs are underutilized and underrepresented in the DON market due to various obstacles. This research aims to determine if the underutilization of the SBC that results in lost competition is due to federal barriers of entry to the market place or due to the perception of the SBC that the market place is bias and unfair. Upon learning what the causes of the barriers to entry are options to facilitate SBC participation in NOA and DON markets will be offered.

D. RESEARCH QUESTIONS

- Does NOA increase SBC participation?
- Where does the SBC best participate in DON contracting?
- Are the barriers to SBC participation real or perceived?
- What options are needed to facilitate SBC participation?

E. RESEARCH METHODS

The researcher will analyze published reports to determine whether the NOA is increasing competition via an encouraged SBC in NOA markets; as an increase in competition is a fundamental benefit of NOA. *This approach significantly increases opportunities for innovation and competition, enables reuse of components, facilitates rapid technology insertion, and reduces maintenance constraints* (Naval Open Architecture Enterprise Team, 2010, p. 2). Research and analysis focused on data collected from www.defense.gov/contracts and www.usaspending.gov to better understand the role of the SBC in DON contracting as the SBC's role relates to competition for prime contracts and ensuing niche market opportunities. The initial data collected from www.defense.gov/contracts required a daily inspection of contracts awarded by the DON for the fiscal year 2012 (FY12) from the review of each daily public announcement a database was derived that captured the name of the company

awarded the contract, the amount of the contract, whether the awardee was a large business, a group of small businesses or a single small business, as well as the date of the award. A total \$66.5B was spent by the DON on the 1,193 prime contracts in excess of \$6.5M per award were publically announced and awarded by the DON from 1OCT11 to 30SEP12 (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Each of the 1,193 contracts is in excess of \$6.5M and publically reported as required by Defense Federal Acquisitions Regulations Supplement (DFARS) 505.303, public announcement requirement.

Government policy and regulations were studied in an effort to define the roles and responsibilities of the SBC, the acquisition professional, the prime contractor as well as the regulating entities within the NOA and DON markets.

F. SCOPE

This research addresses gaps in previously conducted NOA studies. There are a number of conflicting arguments that address the range of success NOA has or does not have when implementing the SBC as a facilitator to increasing competition in the NOA market. This research includes a literature review used to establish the inconsistencies of how NOA and the role of the SBC in the DON market are depicted. There is a glaring omission of real data that exists in previous work concerning NOA and the SBC, past work is far more reliant on existing literature. It is the scope of this work to attempt to reconcile any holes that exist in previous work with real data and provide analysis that will be used to clarify any misunderstanding that might exist on the role of the SBC in NOA and DON markets. From the analysis provided by this research options to facilitate SBC participation in NOA and DON markets will be presented. Additionally, the benefits of DON and SBC association will be discussed and calculated.

G. THESIS ORGANIZATION

This thesis will be organized to present a sequential and comprehensive flow of information, beginning with the introduction of the problem and operational definitions of the variables that impact the SBC and the NOA and DON markets. Following the purpose, methodology and definitions of the research the analysis of relationship between

NOA and the SBC will be provided leading to the options to facilitate SBC participation in the NOA and DON markets. The chapters are organized in the following manner: In Chapter I, the researcher will provide an overview of the thesis problem, purpose and methods. Chapter II will focus on paying particular attention to the operational definitions and existing regulations; laws and policy that collectively form the laws, instructions and guidance that the DON is encouraged to observe when conducting business (in this case the focus will be on the role of the SBC in the NOA and DON markets and how NOA influences SBC participation). Chapter III will offer the analysis of data to determine the role of the SBC in NOA and DON markets and conclude if there are real or perceived market barriers that prevent SBC participation and as a result limit DON benefits of an association with SBCs. Chapter IV will focus on findings and options to facilitate SBC participation in NOA and DON markets in an effort to encourage DON cost savings and to increase benefits through an increase in competition for prime contracts. Chapter V will summarize the research and present the conclusion and limitations of the study that should be further explored.

II. LITERATURE REVIEW

A. NAVY OPEN ARCHITECTURE BACKGROUND

In reaction to the rapidly evolving information technology (IT) environment as well sensitivity to growing IT costs, the Department of the Navy (DON) has developed and implemented a strategy of open architecture (OA) models. *The Navy and Marine Corporations have adopted OA as a way to reduce the rising cost of Naval warfare systems and platforms while continuing to increase capability delivery on shortened demand timelines* (Naval Open Architecture Enterprise Team, 2010, p. 2). On August 5, 2004, the DON released the initial delineation of this strategy in a memorandum titled Naval Open Architecture Scope and Responsibilities. The first version of the Naval Open Architecture (NOA) Handbook was derived from this policy and subsequent versions of the handbook defined the DON's application of OA, as well as outlined the roles and responsibilities of the contractor as well as the program manager (PM). The NOA Handbook also described the associated benefits NOA provided to the organization as well as would be contractors.

Naval Open Architecture (NOA) is the confluence of business and technical practices yielding modular, interoperable systems that adhere to open standards with published interfaces. This approach significantly increases opportunities for innovation and competition, enables reuse of components, facilitates rapid technology insertion, and reduces maintenance constraints. (Naval Open Architecture Enterprise Team, 2010, p. 2)

1. Principles

NOA is built upon five principles that are used to ensure each contract awarded by the DON meets standards of modularity and design disclosure, reusability, interoperability, affordability and competition and collaboration. Table 1 lists the five principles of NOA.

Modular designs and disclosure
Reusable application software
Interoperable applications
Life cycle affordability
Competition and collaboration

Table 1. Five Principles of Naval Open Architecture
(From Naval Open Architecture Enterprise Team, 2010, pp. 65–67)

These standards are intended to be a quick check on a system's disposition that, when properly applied, will yield the benefits of an open system (Naval Open Architecture Enterprise Team, 2010, p. 65).

a. Modularity and Design Disclosure

Modularity is based on the idea that software, middleware and hardware can be separated into singular components to allow for rapid system changes as the environment demands. An anticipated advantage presented by modularity is that there will be increased opportunity for innovative participation in NOA and DON markets.

Design disclosure encourages competition via readily obtainable design specifications; this disclosure is used by the DON to eliminate single source vending practices. Design disclosure permits evolutionary design, technology insertion, competitive innovation, and alternative competitive approaches from multiple qualified sources (Cole S. , 2011, p. 11).

b. Reusability

Reusability is a principle that ensures the maximization of existing technologies and in various systems. *Has the program investigated potential reuse components from other programs?* (Naval Open Architecture Enterprise Team, 2010, p. 65). This principle is used to drive down delivery time and costs of new projects. Reusability encourages the minimal employment of research and development (R&D) expenditures and as a result is in conflict with the NOA benefit of increased competition. Reusability, when enthusiastically employed decreases contract opportunities.

c. *Interoperability*

Interoperability provides the DON with an opportunity to explore the question of whether or not the proposed technology will work in a joint environment with other Federal Agencies (including other military branches). Interoperability asks whether the functions of the technology been well defined to facilitate commonality with other service programs (Naval Open Architecture Enterprise Team, 2010, p. 66).

d. *Affordability*

Affordability is a series of questions that are used to determine whether the project, while meeting requirements, is completed as cost efficiently as possible. This principle considers the system utilization of commercial off the shelf (COTS) material as an option to designing entirely new systems. *Has the program made use of commodity COTS computing and networking hardware to reduce procurement and maintenance cost?* (Naval Open Architecture Enterprise Team, 2010, p. 66). Affordability as a principle does not directly encourage small business concern (SBC) utilization or innovation maximization by the DON.

e. *Competition and Collaboration*

Competition and collaboration is perhaps the most critical principle used to ensure that the SBC is represented in NOA. This principle ensures that the DON maximizes the use of the SBC in NOA in attempt to increase the benefits of SBC participation in NOA markets. *Is there a Small Business Innovative Research (SBIR) and technology transition plan in place to encourage participation by qualified small businesses?* (Naval Open Architecture Enterprise Team, 2010, p. 67). This is the only direct reference to the participation of the SBC in the entire document, however, this question only ensures SBC participation in SBIR, which implies the SBC is only a participant in NOA as a R&D provider. The SBC is not implicated in NOA Handbook as a provider of the modular, affordable and interoperable components of systems.

2. NOA Competition and Innovation

Previous NOA research suggests that there will be a significant increase in opportunities for innovation and competition due to these open standards.

OA naturally encourages competition and collaboration. Unlike systems that are acquired sole-source and restrict the full and open competition of resources, OA promotes competition among industries, leading to better products at a reduced price. In addition, since open standards are used, competition in industry can be leveraged when completing system upgrades or when fielding an entirely new, but interoperable system. (Wolff, 2011, p. 11)

It is often implied by a contingent of NOA supporters that an increase in competition will come in part by way of the qualified small business. This belief is derived from the combination of opinions, the first, being that the component level modularity that NOA is built upon will generate numerous contract opportunities; the second, is that the SBC is a great source of innovation. The NOA emphasis on system reviews is on enterprise architectures, strategic reuse, and the potential for small business participation throughout the program lifecycle (Naval Open Architecture Enterprise Team, 2010, p. 18). A specific focus will be to evaluate whether the system functional definition follows modular design tenets and well-defined interfaces to effectively manage risks of obsolescence and dependence upon a sole source of supply thus increasing competition and the participation of the SBC (Naval Open Architecture Enterprise Team, 2010, p. 18).

There is a developing opinion in the current federal administration that the SBC leads the nation in innovation. SBCs have repeatedly demonstrated a contribution to leading the nation in innovation and driving the economy, as expressed in the example of hiring more than sixty five percent of all new jobs and holding more patents than all the nation's universities and large Corporations combined (USD [AT &L], 2010, p. 10). The federal belief in the SBC and the SBC's ability to innovate places onus squarely on the DON to maximize the participation of the SBC in all phases of acquisition.

3. Competition Guidance

Despite the mounting value placed on the SBC by the Federal Government (FED) there is minimal guidance to PMs to ensure SBC participation in the NOA Handbook. The most direct mention of the SBC is from appendix 3 of the NOA Checklist, asks the question, *and is there a SBIR and technology transition plan in place to encourage participation by qualified small businesses?* (Naval Open Architecture Enterprise Team, 2010, p. 67). This question, however, is limited only to SBIR, which indicates SBC participation in NOA strictly as an element of R&D. What is not mentioned in the NOA Handbook is that participation in the SBIR program does not guarantee that the SBC will ever realize a contract in the NOA market. Contractors have reported difficulties in retaining their data rights in Phase III of the SBIR program, which involves commercialization of the project (House Committee on Armed Services, 2012, p. 66). SBC's participating in SBIR despite having its R&D on a particular project funded by the DON, hopeful of a lucrative award, may not realize an award on an NOA contract because that funding is not provided by SBIR rules. *During phase III, firms are expected to obtain private funding, or other non-SBIR federal funding, to further develop and commercialize their SBIR technology into the commercial marketplace or transition their SBIR technology into DoD programs* (Ryburn, 2012, p. 17). The insinuation that SBCs are to only participate in NOA as providers of R&D, begs the question of where does the increase in competition come from via NOA, and how are the advocated benefits of this increase in competition realized?

The NOA handbook in concert with NOA policy does not adequately encourage SBC participation in NOA markets. NOA policy and guidance does not describe how an increase in competition will be accomplished by the DON or how the benefits of increased competition will be realized. Without this guidance, an increase in competition via NOA cannot be accounted for by the DON. This information is necessary to discern whether or not NOA does in fact increase competition.

Throughout the NOA Handbook there is no direct association made to the SBC and an attempt to increase competition, despite growing emphasis placed on the use of the SBC throughout all federal agencies to maximize competition. It is well documented

throughout the Federal Government Agencies that including the SBC to the maximum practical extent possible is a priority. As a consequence of federal priorities, it should be anticipated in all DON markets (to include NOA markets) that an increasing value will be placed on the participation of the SBC. In May of 2012, the National Economic Council (NEC) demonstrated the SBC emphasis in federal markets by stating that the current administration is *ensuring that every small business can compete for and win federal contracts by awarding nearly \$300 billion in federal prime contracts to small businesses* (GAO, 2012, p. ii). It is because of the federal administration's emphasis on the participation of the SBC that there is the expectation that all federal entities, including the DON, will ensure competitive opportunities for SBC to gain access to prime contract awards.

The NOA Handbook is generalized and does not clearly specify what size enterprise will provide the espoused increase in competition. Increased competition in the form of more large enterprises competing for prime contracts does little to capitalize on the intended NOA benefits of innovation, competition and flexibility. *The goal of maximizing program flexibility to enable competition and programmatic course changes must be balanced against providing the contractor enough incentive to agree to the contract* (Naval Open Architecture Enterprise Team, 2010, p. 4). There is a clear message in the NOA strategy that NOA has set goals to maximize innovation, competition and flexibility, however, the strategy fails to identify how or better yet what type of company will propel the DON to attain these goals. Logically, it would seem that the more enterprises that are introduced to the market, the obvious benefits gained by the DON would be decreased costs and an increased talent pool from which to develop ideas. However, there is little evidence to suggest that NOA has increased competition thus decreasing costs and increasing innovation.

The NOA model is commonly used to establish the argument that the DON believes as a byproduct in the application of NOA there should be an increase in the opportunities for competition. Throughout the NOA Handbook several references are made to competition; *facilitate competition, true competition, increase competition, enable competition, enhance competition, effective competition, frequent competition,*

continuous competition and encouraging competition (Naval Open Architecture Enterprise Team, 2010). Despite the efforts to focus on the concept of the benefits of competition the NOA Handbook fails to clearly and succinctly address the catalyst for the concept of competition. Not only is the catalyst for competition omitted from the NOA Handbook, there also is no clear understanding of the role of the SBC in NOA. Is increased competition accomplished by way of the SBC as a prime contractor? Or is an increase in competition as it applies to the SBC only intended to apply to limited subcontracts that offer little promise of sustained participation in NOA markets? Or even worse, is an increase in competition by way of the SBC reserved solely for R&D through the SBIR program?

B. THE INTENDED ROLE OF THE SMALL BUSINESS CONCERN

There is research that suggests that SBCs are underutilized and reluctant to participate in the NOA and DON market for a variety of reasons. These reasons range from DON bias to large corporations, to multiple barriers of SBC entry to NOA and DON market that are attributed to fees, bureaucracy and perceptions (Cole et al., 2012, p. 89). *Startups and other small businesses are often told that government contracting is a great option for business growth, but the process of competing for government contracts seems complicated and challenging* (Mills, 2011, p. 11).

The SBC is often regarded as a facilitator to increase competition in technological markets, defined for the purposes of this research as Advanced Data Processing (ADP), Information Technology (IT) and Telecommunications (TELECOM) due the modularity of systems and a preponderance of software, middleware and hardware in these Product Services Codes (PSCs) will be referred to as the NOA market. However, there is little evidence to suggest that the NOA has fully capitalized on the employment of the SBC or that the SBC is a priority for DON market professionals, where the DON market is defined as all PSCs (both technical and non-technical) combined.

The language used in the guidance to PMs by the DON to incorporate SBCs in NOA and DON markets is suggestive; and the governance of programs designed to protect the SBC are questionable. Due to a lack of governance, large firms have shown a

repeated pattern of cutting small businesses out of the marketplace (Womble et al., 2011, p. 30). When this lack of governance occurs, the government loses a competent innovator and price competitor—increasing the potential for mediocre performance, cost overruns, and schedule delays (Womble et al., 2011, p. 30).

There is no specific guidance offered via NOA Handbook to DON PMs to leverage the SBC to increase competition via NOA. However, it has been stated by numerous NOA supporters that an increase in competition must come via the SBC in order to capitalize on the propensity to innovate that is often attributed to the SBC. *It was anticipated that OA principles would enable small, innovative businesses to enter the defense market* (Cole et al., 2012, p. 89).

NOA is built on a foundation that as a result of thorough NOA procedures that, when properly executed, will result in an increase in competition in the NOA market. As a byproduct of increased competition; lower costs and improved product development times are anticipated benefits when executing NOA. Lowered costs by way of an increase in competition across all phases of NOA markets would seemingly be the goal of NOA; however, there is evidence to suggest that the SBC is not being utilized to the fullest extent possible as a result; the DON is missing competition and innovation opportunities. Data suggest that regardless of the product or service certain companies have been and will continue to be awarded to large contracts despite the application of open architecture models in NOA and DON markets (United States Government, 2013). The recurrence of the same prime contractors being awarded contracts is contrary to the advocated value of the SBC conveyed by the current administration.

From Main Street shops to high-tech startups, America's small businesses and entrepreneurs are the engine of our economy and one of our country's greatest assets (White House, 2012, p. i). Large corporation biases seemingly eliminates the SBC from participating in the NOA and DON primary markets and the recurrence of the same SBCs being awarded contracts, limits most established or start up SBCs to the secondary niche markets in the form of a subcontractor or R&D provider. While sub-contracting can be of benefit to the SBC, it is important to point out the sub-contractors relinquish some control over the project and become beholden to the demands of what evidence suggests

is very limited number of prime contractors that the NOA and DON markets use time and time again. There is a troubling recurrence of the same top contractors awarded prime awards for FY12 and this is disconcerting considering the \$94.5B in contracts awarded by the DON in FY12 (United States Government, 2013), and the relevance of the SBC's role in the United States' Economy. *Over the last two decades, small and new businesses have been responsible for creating 2 out of every 3 net new jobs, and today the country's 28 million small firms employ 60 million Americans, half of the private sector workforce* (White House, 2012, p. i).

C. WEAKNESS IN LITERATURE

A recurring weakness in NOA literature is that there is a lack of quantitative evidence to support claims made that NOA is increasing or decreasing competition or capitalizing on the innovative nature of SBCs. The SBC is presently providing the products, solutions needed to support Sailors and Marines, and can provide the innovations necessary to help solve life cycle sustainment problems (Dussault, 2012, p. 13). Due to NOA competition and innovation claims, unsupported by data, there is a necessity for contract award data to be collected and analyzed to demonstrate NOA success or failure. As the cumulative effect of the guiding principles of NOA suggest, NOA should decrease DoD cost through an increase in competition that can be leveraged when negotiating contract costs. It is significant for the DON to understand through data if there has been an increase in the involvement of SBCs in NOA markets due to NOA guidance as predicted.

D. BARRIERS TO SBC PARTICIPATION

The SBC is typically portrayed as an underdog that is deterred from participating in the DON market due to a number of barriers to entry (Cole et al., 2012, p. 89). Large defense companies have complied with the DON's risk mitigation requirements primarily due to large monetary resources (Cole S. , 2011, p. 20). However, these same requirements eliminate much of the potential competition and innovation available by way of the SBC (Cole S. , 2011, p. 20). It is not clearly understood, through available research, whether these barriers are real (created by the DON) or perceived

(misunderstood by the SBC) or a combination of both. As recently as March 19, 2012, the House Committee on Armed Services conducted a panel on the *Challenges to Doing Business with the Defense Department* this panel explored opportunities to reduce Defense Industry barriers to entry. A portion of this panel focused on the role of the SBC and barriers that applied specifically to SBCs in participation in the Defense Industry (to include DON). There is a preponderance of literature that suggests there are SBC barriers to participation. It has been reported that FY12 competition figures reflect significant barriers to competition due to reliance on non-competitive follow-on procurements for mature weapon systems, directed source (foreign military sales) buys, and limited new starts of major weapon programs in the current budget environment, said Pentagon spokeswoman Lt. Col. Melinda Morgan (Castelli, 2013, p. 1).

However, real contracting data has not been collected and applied to these reported barriers to determine whether these barriers are real or perceived by various NOA and DON market participants. The following section focuses on some of the barriers that are most likely to influence SBC participation in NOA and DON markets.

1. Design Disclosure

Design disclosure is defined as within the constraints of contractual data rights, a detailed description of the contractor's approach to facilitate the sharing of system or component (e.g., software, hardware, middleware) design information (Naval Open Architecture Enterprise Team, 2010, p. 20). Design disclosure is a potential barrier to SBC participation due to the SBCs amplified reliance on its limited innovation and creative ideas. *Innovation and creative ideas are the intangible assets of companies that increase the value producing momentum and provide new opportunities for competitive positioning* (Bounfour & Housel, 2011, p. 1). Due to design disclosure requirements, a SBC could potentially eliminate itself from NOA and DON markets initiated by the perception of a threat from competitors that have access to intellectual property due disclosure requirements. In a 2012 report by the House Committee on Armed Service, a defense representative noted that the pace of business is picking up but DoD contracting

is not responding due to increased oversight and mandated disclosures of proprietary information (House Committee on Armed Services, 2012, p. 85).

The SBC's primary dilemma when participating with the DON is that the SBC is outwardly more reliant upon its limited intellectual property. When intellectual property is used as the catalyst to provide innovative ideas that yield organization survivability the large corporation (when compared to the SBC) has more intellectual property to disclose. For instance, over the course of the past 24 months BAE Systems INC., a top DON contract awardee, submitted 156 patents in the U.S. compared to the one patent submitted in the U.S. by the top DON ADP Software provider, Blue Tech INC. (LexisNexis, 2013). *Unlike larger firms, if small firms succeed, they must stay on the leading edge of technology and innovation; they do not have the luxury of a foundation of long-term government contracts to sustain them if they fail to perform* (Garrett, 2007, p. 12). The SBC must judiciously consider the profound impact on its organization when disclosing what appears to be a disproportionate amount of limited intellectual property in order to do business with the DON. The repercussions of BAE disclosing one of its 156 patents, in this example six-tenths of a percent of its intellectual property to the DON is less likely to impact the survivability of BAE Systems INC. Conversely, it would appear that Blue Tech INC. can ill afford to disclose one hundred percent (one of one) its intellectual property in order to participate in the NOA or DON market.

One of the most pressing concerns the SBC faces in being a primary contractor or subcontracting for a large corporation in NOA and DON markets, is that once the initial contract is complete and its intellectual property is relinquished to the DON, what then does the SBC retain as leverage for future opportunities? *The Offeror shall describe its plan for making design and interface information available as soon as possible after it is defined or established* (Naval Open Architecture Enterprise Team, 2010, p. 37). The SBC once participating in the NOA or DON market has the obligation to submit design information as soon as possible. This type of expedient disclosure provides the DON or prime contractor with a significant amount of time to review designs and solicit follow on competition. The primary contractor no longer has an obligation or a reliance on unique

intellectual property specific to the originally contracted SBC (because NOA requires design disclosure) for competitive alternatives.

Design Disclosure means making data related to the design of a component, subsystem or system available to qualified recipients, with a goal of establishing and maintaining a process that will provide “early and often” design disclosure directly to the Government or to third-party contractors via Government-established access. This data is sufficient to allow the third party to develop and produce a competitive alternative. (Naval Open Architecture Enterprise Team, 2010, p. 79)

It appears that through long standing relationships with the DON that top large Corporations hold considerable strategic advantages when participating in the DON market. As seen by the fifty-one percent of FY12 DON prime contracts in excess of \$6.5M awarded to just ten companies (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). With intellectual property divulged the large corporation in collaboration with the DON can seek alternative subcontracting opportunities through different SBCs. Once intellectual property has been disclosed, and the initial contract obligations have been met, the prime contractor along with the DON has an opportunity to consider an SBC that has a recurring relationship with a specific prime contractor similar to the preference displayed by the DON when awarding recurring prime contracts to familiar companies.

When participating in NOA and DON markets the SBC, as a primary or subcontractor, is gambling that their organization will retain project opportunities for future phases, version updates or system upgrades by virtue of being the originator of the technology. This type of guarantee is difficult to come by in what is supposed to be and touted as a competitive process by the Department of Defense (DoD) and DON. When multiple contractors are involved the DON is generally required to provide all contractors a fair opportunity to be considered (GAO, 2012, p. 1). Through NOA the DON would like to stimulate an environment that encourages the SBC to participate in technology markets. SBC participation not only accounts for increased competition and the benefits associated with maximizing competition but it is also important to mention the significance of the public appearance that the DON is an entity that is stimulating the economy through the healthy employment of the SBC

2. Prime Practices

Prime contractors in our review told US they structure their subcontracts to provide the required items, while reducing their risk exposure and maximizing their profit potential. For example, prime contractors generally attempted to shift cost risk onto their subcontractors through the Use of fixed-price subcontracts even when their own contract with the government was cost-reimbursement. (GAO, 2010, p. 4)

A recent report by the House Committee on Armed Services describes a process in which federal prime contractors are utilizing subcontractors at an increased rate. At first glance this seemed to be a positive result of regulations aimed at incorporating more business into the federal market place; namely an opportunity for SBCs to find additional entry to the DoD acquisition process. However prime contractor practices as they apply to sub-contractors (namely SBCs) have come under increased scrutiny from some in the Defense Industry. A Defense Industry Representative stated that DoD contracting officers have no visibility into discussions between prime contractors and subcontractor and that once a small business was rolled up into a large contract, contracting officers have no visibility on the fact that large primes pressure subcontractors to cut prices, only to increase profit for the prime (House Committee on Armed Services, 2012, p. 89).

Companies that are awarded prime contracts are expected to *give full and fair consideration to qualified sources other than the prime contractor for the development or construction of major subsystems and components of major weapon systems* (GAO, 2010, p. 2). A representative from the Defense Industry pointed out that a typical practice is that large prime contractors decide on their sub-contractors with little to no government oversight and that prime contractors consistently use the same small set of sub-contractors (House Committee on Armed Services, 2012, p. 82). As a result an opportunity for SBC participation is foregone by the DON and left to the prime contractor to decide on SBC market participation. Again, this points to a potential barrier for SBC entry to NOA and DON markets and suggests that the sub-contracting process is not always competitive.

Despite regulations that allow the government to intervene, the prime contractor remains largely unregulated by the DON in its subcontracting effort. However, program

officials seemed reluctant to use available acquisition regulations that enable the government to gain visibility into the prime contractor's subcontracting effort, largely because of fears regarding government liability (GAO, 2010, p. 7). Utilizing rightful authority and implementing the use of all government regulations is an opportunity to facilitate SBC participation in the federal market place.

Some participants indicated that big business was predisposed to an engineering solution and a small set of subcontractors that they consistently use. It was stated that it was very difficult to get the primes to listen to small business ideas and that "big business is in control." It was suggested that small businesses need direct access to the DoD decision-makers/acquisition officials because big business did not want direct competition from small business. One participant specifically stated that he felt that the end-user, not the prime contractor, should make the decision to go with a specific sub-contractor/small business to buy a component/end-item. (House Committee on Armed Services, 2012, p. 82)

SBC advocates often cite barriers that prevent the DON from maximizing the use of the SBC as a method to leverage competition and capitalize on SBC innovation. The perceived failure of the DON to include SBCs in the defense area is a failure that is diluted by the claim that SBCs contribute at a much more prevalent rate as subcontractors. *Based on some estimates, 60 to 70 percent of work on defense contracts is now done by subcontractors, with certain industries aiming to outsource up to 80 percent of the work* (GAO, 2010, p. 1). However, participation as a subcontractor leaves the SBC bound to a prime contractor that may use its leverage to exploit the SBC's willingness to participate in NOA and DON markets or worse yet use the SBCs own intellectual property (because of design disclosure) to its advantage for SBC elimination on follow-on contracts. Questionable large prime contractor practices as they apply to sub-contract awards to SBCs have been observed including a failure of the government to influence sub-contract decisions. In a 2010 briefing to Congress, the GAO described practices between prime and sub-contractors as biased stating that prime contractors rely heavily on affiliates from within their own companies to perform sub-contracted work (GAO, 2010, p. 37). The report went on to state further evidence of biased prime contractor practices to sub-contractor selection stating that some prime contractors select and manage affiliates that may work on their programs using some of the same methods

as with external sub-contractors (GAO, 2010, p. 37). It is clear to understand based on these statements why a SBC would be hesitant to participate in NOA or DON markets. Typical prime contracting practices are not influenced by the DON and as a result leave the SBC at the mercy of the prime contractor. Contracting officials stated that the government wants to avoid influencing major decisions such as sub-contract competition to prevent government assumption of the prime's responsibilities (GAO, 2010, p. 35).

The barrier presented by the lack of oversight and questionable prime practices is an ongoing concern of the SBC. Multiple reports have been generated that support the claim that there is a fundamental lack of government protection for the SBC rights as well as SBC intellectual property. Two years after the aforementioned GAO report, the House Committee on Armed Services stated in a 2012 report that DoD contracting officers have no oversight on the discussions that take place between prime and sub-contracts and went on to state that prime contractors pressure sub-contractors to cut prices only to increase profit for the prime contractor. (House Committee on Armed Services, 2012, p. 89). The argument that predatory prime practices prevent the SBC from participating in NOA and DON markets seems plausible given that both prime contractors and government officials agree that sub-contract awards are not determined by an unbiased entity. *Prime contractors and government officials stated that the government does not play a role in determining whether to award subcontracts competitively or sole source* (GAO, 2010, p. 35).

3. Risk

SBCs, cannot participate in the DON due to risk suppression mechanisms and the exorbitant costs to enter the market (Cole et al., 2012, p. 89). SBCs cannot afford to follow bureaucratic rules and restrictions imposed by the current process in the DON (Cole et al., 2012, p. 89).

According to the authors, SBCs incur obstacles; namely the risk adverse culture, exorbitant entry costs and bureaucracy and as a result cannot participate in the federal market place. The volumes of regulations specific to government and defense contracting dissuades many companies from participating in and competing for

government contracts (House Committee on Armed Services, 2012, p. 73). Given the DON's principle that NOA increases competition and this claim made by Cole et al. and the House Committee on Armed Services, it is reasonable to assert that NOA must only increase competition for a limited number of prime contract providers. Increasing competition for the same prime contractors time and time again would be a failure to capitalize on the innovative nature of the SBC. Not only would the DON miss an opportunity to increase innovation the DON could not experience decreased cost due to the leverage created by increased competition. While multiple resources identify that SBCs are deterred from participating for DoD contracts for a variety of reasons, such as the DoD's aversion to risk, SBC cost to enter the market and rules and restrictions the research falls short in an attempt to explore the reasons for the sentiment. *Many described the defense acquisition workforce as part of a "risk-averse" culture where program managers, in particular, have difficulty in balancing risks in managing cost, schedule and performance of acquisition programs* (House Committee on Armed Services, 2012, p. vi).

Understanding if the barriers to SBC participation are real or perceived or a combination of both will allow for an increased understanding of obstacles that SBCs encounter when participating in NOA and DON markets. From analysis of these obstacles options to facilitate SBC participation in NOA and DON markets can be derived.

Large prime contractors have complied with the DoD's low-risk requirements primarily due to large monetary resources (Cole S. , 2011, p. 20). However, these same requirements eliminate much of the potential competition and innovation available in SBCs (Cole S. , 2011, p. 20).

A claim is made that SBC competition is eliminated by DoD requirements, in this case as cited by Cole due to *large monetary resources* used to suppress DoD (in this case DON) risk (Cole S. , 2011, p. 20). Cole (2011) offers that there is a problem in which SBCs remove themselves from the competitive process because of upfront fees and costs designed by the DoD to minimize potential risk. The idea that there is a pay to play obstacle that prevents potential benefits to competition is introduced as a barrier to SBC

entry to the NOA and DON markets. This barrier encourages the superiority of the large prime contractor resulting in the elimination of the SBC as a catalyst to increase competition through NOA. The SBC must weigh the entry costs as they decide to enter the DON market vs. the actual resources available to attempt to do business with the DON. SBCs which often do not have the resources to hire counsel or experts in government contracting, may find government contracting too difficult to navigate (House Committee on Armed Services, 2012, p. 59). Unfortunately, there is no quantifiable data to support the claim that the SBC is eliminated by the DON because of risk suppression mechanisms or through a process of self-elimination due to entry costs that cause a failure of the SBC to participate in NOA and DON markets.

E. SBC PROTECTION

The DoD and by extension the DON is cited in recent research as not providing adequate oversight to SBC participation in NOA and DON markets. The panel found that DoD lacks the ability to track small business participation at the lower subcontract tiers. (House Committee on Armed Services, 2012, p. vi). The lack oversight was not the only mentioned failing of the DoD as it applies to the SBC, the report went on to state that the DoD lacks a culture that encourages SBC participation where appropriate. (House Committee on Armed Services, 2012, p. vi). Despite the findings in the House Committee on Armed Services 2012 report it must be pointed out that the DON along with the FED has taken measures to ensure that the SBC is properly represented and protected in NOA and DON markets. Federal Acquisitions Regulations (FAR), Small Business Innovative Research (SBIR) Program in conjunction with the Small Business Act (SBA) collectively form the protection policy of the SBC in NOA markets. It is in the best interest of the DON to encourage SBC participation and through these restrictions the DON provides the SBC with what is thought to be a fair and level playing field that allows for open competition for DON contracts. When the government restricts competition to small businesses, it has vested interest in seeing that a substantial portion of the work is actually performed by small businesses (House Committee on Armed Services, 2012, p. 24).

Unfortunately, the rules governing the control on sub-contracting are written in such a way that businesses attempting to comply are confused, and contracting personnel are hard pressed to determine if the rules are being followed (House Committee on Armed Services, 2012, p. 25). While the essence of regulations is to protect the SBC, the regulations are only as good as they are enforced and understood. The following three SBC protection mechanisms, FAR, SBIR and SBA collectively form the protection policy as it applies to the SBC via the NOA Handbook.

1. Federal Acquisitions Regulations

Part 19 of the FAR defines what federal definition of a “small business” is as well as thoroughly describes the roles and responsibilities of all acquisition participants and organizations; as it applies to federal acquisition practices. The FAR also recommends strategies for contracting officers to use when considering the inclusion of small businesses when determining contract awards. The FAR is used to gain a better understanding of the definitions, regulations and policies that contracting officers must adhere to when considering a small business as well as to gain an understanding of what obstacles a small business may encounter when attempting to submit a competitive bid on a prime contract.

This resource provides in great detail the legal aspects of what constitutes a small business from a federal perspective. However, and rather surprisingly, the FAR fails to state specific target metrics when awarding prime contracts to small businesses. There is an abundance of suggestions on how to encourage small business participation and solicitation but it is obvious that the document merely suggests certain contracting behaviors. The contracting officer is only obligated to consider a small business as a viable option rather than award a small business a prime contract.

As a result of the suggested behavior rather than directed behavior there appears to be an opportunity for contracting officers, if so inclined, to consistently award contracts to large prime contractors and further perpetuate the tendency to choose a known commodity. The FAR is equally as suggestive to the prime contractor and

appeals to the prime contractor to provide SBCs the maximum opportunity to participate in NOA and DON markets.

Any contractor receiving a contract for more than the simplified acquisition threshold must agree in the contract that small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns will have the maximum practicable opportunity to participate in contract performance consistent with its efficient performance. (Department of Defense, 1998, p. 19)

Given the suggestive nature of the guidance to agencies as well as prime contractors it is not very difficult to understand the SBCs hesitation to enter NOA and DON markets.

2. NOA Handbook (SBIR)

There is a predisposition for large prime contractors to dominate the NOA and DON markets. As a consequence of the DON's reliance on large prime contractors, the SBIR Program was developed in an attempt to provide the SBC with the opportunity to participation in NOA and DON markets. SBIR contracts are used by small businesses to cleave a foothold into the defense marketplace (Womble, et al., 2011, p. 30). The SBIR program is designed to give the SBC a prospect at gaining entry into NOA and DON markets and has been met with mixed reviews. Without governance, large primes have shown a recurring pattern of cutting SBCs out of NOA markets (Womble et al., 2011, p. 30). Just as other regulations put in place to protect the interest of the SBC the oversight of SBIR has faced negative scrutiny. Without the proper control and oversight the SBC is lost as are the benefits of SBC participation in the NOA market. When the loss of oversight occurs the government loses a competent innovator and price competitor (Womble, et al., 2011, p. 30).

The prevailing thought on the complexity on the guidance for the SBIR program is not unlike most federal acquisition programs. The perception among SBIR critics is that while the program is well intended the program is difficult to participate in and presents the SBC obstacles through complexity that curtail SBC participation. *There was*

strong concurrence from the panel that the SBIR program is very difficult to use and needs to be simplified. (House Committee on Armed Services, 2012, p. 82).

As the DON shifts to NOA, there is an opportunity to expand competition to many suppliers including SBCs for separate components of the system (Bland, Busch, & Clark, 2008, p. 26). There has been an expectation from the onset of NOA that the competition would be increased resulting in the decrease of cost due to increased competitive leverage, further, it was intended that the increase in competition would be generated by in large from the SBC.

The SBIR program is limited in its scope and only provides an avenue of participation for the SBC in the form of R&D. The addition of a SBC program that focusing entirely on R&D is not nearly comprehensive enough of a program to ensure the maximum participation of the SBC in NOA markets, including procurement. The SBIR program does not ensure that the innovation being generated by the SBC will ever be fully funded (Phase III) and delivered to the DON. The SBIR program while designed to be a catalyst to encourage SBC R&D should not be viewed as an instigator of SBC participation that increases competition in NOA markets. As mentioned previously in this research, there is no guidance provided via the NOA Handbook or by virtue of a collection of associated regulations that spells out how the SBC will be utilized to encourage competition throughout the entire NOA enterprise.

3. Small Business Act

It is the policy of the United States that small-business concerns, shall have the maximum practicable opportunity to participate in the performance of contracts let by any Federal agency, including contracts and subcontracts for subsystems, assemblies, components, and related services for major systems. (Small Business Act, 2008, p. 1)

The NOA Handbook and the FAR both reference the Small Business Act (SBA) as a document that provides the various legal definitions of what Federal Agencies are to consider a SBC as well as guidance on the employment of the SBC. As is the case with the FAR and NOA Handbook, the SBA as it applies to the SBC and competition is suggestive rather than directive guidance. The suggestive tone of the SBA provides

Federal Agencies with flexibility in the interpretation of “maximum opportunity” for the SBC. While flexibility in what constitutes the “maximum opportunity” for the SBC is a valuable tool that the DON uses to implement programs such as SBIR, the same allowance for flexibility in the interpretation of “maximum opportunity” introduces inconsistencies throughout the DoD on the employment of the SBC. Irregularities on the employment of the SBC has led to inconsistencies in the application of DoD regulations that are put in place to ensure that participants are held accountable to standards and to certify that the SBC has fair opportunity to compete in NOA and DON markets. The following excerpt from a 2012 report by the House Committee on Armed Services is an example of how inconsistencies in guidance impact accountability in contracting practices. It was stated that participants (including primes) are not held accountable for compliance with their SBC contracting plans and will often swap out subcontractors after winning the contract (House Committee on Armed Services, 2012, p. 108).

The SBA also provides a background on why it is of the utmost importance to the U.S. that the SBC is protected and properly represented in the federal market place to include NOA and DON markets. The American economic system is built on full and free competition of free markets, free entry into business, and opportunities for the expression and growth of personal initiative and individual judgment is assured (Small Business Act, 2008, p. 1).

The preservation and expansion of such competition is basic not only to the economic well-being but to the security of this Nation. Such security and well-being cannot be realized unless the actual and potential capacity of small business is encouraged and developed. (Small Business Act, 2008, p. 1)

Rather than provide a framework of precedence in the form of directed and precise guidance to the DoD, the SBA just as the FAR and NOA Handbook is suggestive and does not adequately protect the SBC’s competitive opportunities. The absence of directed guidance as it applies to SBC opportunities to compete has origins in the SBA and as a result subsequent guidance derived from the SBA suffers from a lack of pointed guidance that would provide real protection for the SBC.

4. Quotas

It is widely publicized throughout the DoD/DON that there are quotas generated for each FY and that these quotas are designed to ensure the proper percent of SBC participation in NOA and DON markets. Seen in Table 2 is the SBC target quotas generated by the DoD for FY 09-11, the target goal for FY12 was 22.5% for FY13 the target is 23%. The government-wide prime contracting goal is currently 23 percent of all prime contract dollars (House Committee on Armed Services, 2012, p. 13).

Prime Contracting Goals	FY 2009	FY 2010	FY 2011
Small Business	22.24%	22.28%	22.28%
HUBZone Small Business	3.0%	3.0%	3.0%
Service-Disabled Veteran-Owned Small Business	3.0%	3.0%	3.0%
Small Disadvantaged Business *	5.0%	5.0%	5.0%
Women-Owned Small Business	5.0%	5.0%	5.0%
Historically Black Colleges & Universities and Minority Institutions **	5.0%		

Table 2. FY 2009-11 DoD SBC Goals
(From House Committee on Armed Services, 2012, p. 81)

These goals are used to ensure DoD/DON wide that there is a certain level of competition and participation attained by and through SBC involvement in federal markets. The existence of goals indicates that the DON is cognizant of the necessity to include SBCs but what are fundamentally absent from these goals are the motives for selecting a specific number. The presence of a goal along with suggestive FAR, NOA and SBA guidance to maximize opportunity for SBCs indicates that the DON considers twenty-three percent (FY13) to be the maximization of the opportunity for the SBC. This type of pre-determined goal assigning demonstrates that the maximum opportunity for the SBC is somehow measured at the start of each FY. The goal defines maximum SBC opportunity in the current practice rather than the end of year figures where the end of year percentage is a representation of the maximization of opportunity for the SBC.

The Defense Department failed to meet its goals for achieving competition in acquisition programs in fiscal year 2012 (Castelli, 2013, p. 1). Castelli's quote begs the question: Was the goal for FY12 too high? The end-of-year figure should have been a representation, given the suggested guidance of the maximum opportunity for the SBC in the DoD Market. So how can a goal ever be assigned? The assigning of a goal seems arbitrary and seems to only provide a bench mark of achievement vs. the maximum opportunity for the SBC.

F. SUMMARY

There are various reports that exist that suggest the merits or failings of DON policy as it applies to the role of the SBC in NOA and DON markets. However, existing research is by in large only supported or refuted by literature, there is little data analysis completed to substantiate or refute claims made in secondary literature. Available data does not offer complete analysis of all purchases with small businesses (Edison, Grammich, Keating, & Moore, 2011, p. xii). This research is a study of the role of the SBC in NOA and DON markets using data collected in Chapter III and analyzed in Chapter IV to fill gaps presented in literature review in Chapter II.

The literature review is a five section evaluation of: NOA guidance for the utilization of the SBC, the role of the SBC in NOA and DON markets, the weaknesses in existing literature, barriers (real or perceived) to SBC entry and the protection that is provided to the SBC through law and policy.

Section one begins with a look at the NOA Handbook to determine the extent of the association of the SBC, NOA strategy, innovation and competition. Reviewing the handbook and the principles that provide the foundation of NOA establishes the intended role of the SBC as a source of increased competition in NOA markets.

Sections two and three of the review focused on intended the role of the SBC in NOA and DON markets through various reports. The usefulness of these sections of the review is that it demonstrates the conflicted thought on what the SBC should provide to the DON, specifically in NOA markets. These sections set the stage for what are considered to be barriers to SBC entry to NOA and DON markets.

Section four of the review discusses the barriers to entry that the SBC could potentially encounter while participating or deciding to participate in NOA and DON markets. The specific barriers discussed are design disclosure, prime contractor practices and how risk influences the decisions of the DON and the SBC as they apply to SBC participation. Design disclosure speaks to the apprehensive nature of the SBC due to DON Requirements to disclose potentially sensitive information to the DON and potentially to competitors in order to participate in NOA and DON markets. Review of prime contractor practices was conducted in order to describe an environment that would cause the SBC to decide not to participate in the NOA and DON markets. *It may also be the case that many small businesses are simply not interested in government procurement* (Edison et al., 2011, p. xii). The prime contractor practices section provides an understanding on why it is important to maximize SBCs as prime contractors, not only for the DON (increase competition) but for the SBC (not beholden to typical prime practices). Last, in section four there is a barrier to entry that is attributed to the DON's aversion to risk; this section explores the idea of a recurring relationship between the DON and specific providers as a risk mitigation tool that has been implemented by the DON that results in the elimination of potential competition through biases.

The last section of Chapter II focuses on the major protective guidance and quota for the SBC in NOA and DON markets. The FAR, NOA Handbook and SBA all play an important role in the utilization of the SBC in NOA and DON markets. It is interesting that all of the reviewed guidance is suggestive and leaves room for agency or department interpretation in the execution of SBC guidance. The suggestive nature of the documentation can in some cases be positive for the SBC and at other times a catalyst for questionable practices that decrease the SBC's opportunity to participate. Lastly the use of quotas as guidance and the impact of pre-determined quotas are discussed to raise the question of just how much participation is considered maximum participation of the SBC in NOA and DON markets.

The primary focus of this research is to challenge or substantiate the claims made in reference to NOA barriers and provide options to maximize SBC participation in NOA and DON markets. The idea that there are barriers that prevent participation by all interested and qualified candidates suggests that the DON is not capitalizing on the potential of an increase relationship with the SBC.

III. DATA, PROFILE AND ANALYSIS OF DON/NOA/ADP CONTRACTS AND PARTICIPANTS

A. METHODS AND RESEARCH INTRODUCTION

In order to understand the impact the small-business concern (SBC) has on Naval Open Architecture (NOA) via competition, claims made by both supporters and opponents must be explored through real market data. The actual market available for the SBC to make a contribution must first be established and legitimized through a study of NOA and Department of the Navy (DON) market awards. Existing research has yet to focus on primary and niche NOA and DON markets in order to comprehensively explore the barriers to entry and options to facilitate SBC participation in NOA as well as the entire DON market. The analysis of the entire DON market, all product service codes (PSC) will allow for a considerable amount of data to be compared and contrasted to NOA (Advanced Data Processing [ADP]/Information Technology [IT]/Telecommunications [TELECOM]) Markets and ADP (ADP Software) Markets. This comparison will be used in an effort to establish a baseline of typical SBC participation in both primary and niche NOA and DON markets. It is only after this baseline has been established the determination of whether or not NOA does increase competition via the SBC thus delivering on its founding principles, namely increased competition, decreased costs and a maximization of innovation. Operational baselines determined by award data, company profiles and market characteristics will allow the DON and SBCs to clearly understand how well NOA practices and policy are increasing SBC participation when compared to SBC participation in non NOA markets (DON markets). It is imperative that the characteristics typical to recurring awardees are understood in order to provide SBCs with a reference to follow in becoming a competitive DON prime contractor.

The analysis of prime contracts is important to this research in order to observe the opportunity for a single source SBC to be awarded a substantial prime contract that not only accounts for a considerable amount of money but just as importantly allows the SBC to maintain some degree of innovative independence through the self-sufficiency gained as a prime contractor. A single sourced SBC prime contractor is characteristically

removed from the considerable influence large corporations retain over subcontracted SBCs. This autonomy affords the SBC greater opportunity to self-govern resulting in an added innovation and flexibility to the DON.

Initial data for this research was collected from www.defense.gov/contracts and www.usaspending.gov. The data collected from www.defense.gov/contracts focused on DON market (all PSCs) awarded to large and SBC prime contractors where the awards were \$6.5M or greater. Due to Defense Federal Acquisition Regulation Supplement (DFARS) subpart 205.303, Announcement of Awards, paragraph a, section 1, revised 2010, requires that the DoD report all contractual actions, including modifications, which have a face value, excluding unexercised options, of more than \$6.5M are reported daily via a public announcement (Department of Defense, 1998, pp. 205.3-1).

Data was collected on both large prime contractors and SBC prime contractors. This data was collected over the span of the 2012 Fiscal Year through data extraction from the summary of daily contracts awarded by the DON. The researcher focused on the amount of the contract, the size of the company (large corporation or SBC) awarded the contract and the date of the award. This information was then entered in to a database that provided the foundation for the researcher to conduct an analysis of DON contract behavior. The analysis of the contract data was used to substantiate or refute claims in existing literature that suggest barriers that may or may not exist to the SBC in participating in the NOA and DON market

The analysis of the www.defense.gov/contracts data yielded trends associated with the contracting behavior of the DON in DON markets when utilizing both large and SBC prime contractors. From the derived database the top five large prime contractors and top five SBC prime contractors were determined by the total amount awarded to the a specific company. These recurring top awardees generated the first of several company profile lists that would be used to establish commonalities among persistent award winners both large and SBC primes. The common characteristics among these top companies provided the researcher with an opportunity to compare not only like size companies (SBC vs. SBC) or (large vs. large) but also the characteristics common to both large and SBC primes. Trends and characteristics discovered were then used to

substantiate or refute claimed barriers to entry and to formulate potential options to facilitate SBC participation in NOA as well as DON markets.

To gather the same data on DON contracts from ranging from \$1–\$6.49M in the DON market that are not legally obligated to be publically announced data was collected and analyzed from www.usaspending.gov. The use of www.usaspending.gov data also allowed for research to focus on specific areas of interest used to explore the SBC role specific to NOA. The data collected from www.usaspending.com was similar to the data initial data collected from www.defense.gov/contracts and yields the number of contracts awarded to large and SBC prime contractor and the dollar amount of the award (combined total as well as per company total). The prime award advanced search function on the website was conducted by performing the search using the following criteria:

- Spending Type—Contracts
- Department/Agency—9700 (DoD); 1700 (DON); 1795 (DON)
- Federal Spending—\$1-6.49M; \$6.5M-empty set
- Fiscal Year—2012
- Contractor Type—blank = large prime; * = SBC

*It must be pointed out that for the purposes of the research conducted on www.usaspending.gov the term SBC was represented in an advanced search as contract type that included the following:

- 8A Firm
- American-Indian Owned
- Asian-Pacific American Owned
- Black-American Owned
- Emerging Small Business
- Hispanic-American Owned
- Historically Underutilized Business Zone (HUBZone) Firm
- Minority Owned
- Native-American Owned
- Service Disabled Veteran Owned

- Small Business
- Small Disadvantaged Business
- Sub-continent Asian (Asian-Indian) American Owned
- Veteran Owned
- Women Owned
- PSC–All unchecked = DON market; 70 & D = NOA market; 7030 = ADP Market (Software)

Collecting data from www.usaspending.gov was done in order to collect similar data to be used to compare the information found on the two websites. The findings reported by these databases are similar despite the use of different terms. The data collected from www.usaspending.gov similar to www.defense.gov/contracts included a list of the top awardees for a given market. After collecting the data on for all contracts of a \$1 or more awarded by the DON in FY12; the NOA market data was collected and analyzed, this data was split into four categories, NOA Large primes over \$6.5M, NOA SBC Prime over \$6.5M, NOA Large primes \$1–6.49M and NOA SBC Primes \$1–6.49M. Research focused on the amount of the awards and the top awardees for each category. Specifically this research focused on all contracts awarded by the DON to both large and SBC prime contractors that fell under the product service codes (PSC) 70 (Advanced Data Processing) and D (Information Technology/Telecommunications). Collecting data on the NOA market allowed for a comparison of the role of the SBC in both the DON market (all products and services) vs. the NOA market (ADP, IT/TELECOM) to find out if one market was more favorable for SBC participation. The top producers in each market both large and SBC primes were then analyzed to provide company profiles used to generalize business characteristics of highly successful DON contract awardees.

To provide more clarity on SBC participation data was drawn on a specific niche NOA market, ADP market (software). The ADP market was examined and split into the same four categories as the DON market and NOA markets to provide a review of the role of intellectual property on the SBC's participation in technology markets. This analysis also considered the innovation gained by the DON through utilization of SBCs. The ADP data was compared to previously collected data on the NOA market as well as

the DON market, seeking trends in awardee characteristics as well as to determine if there was a greater propensity by the DON to award the SBC contracts in smaller more technological dependent applications that typically are enhanced through the innovative environment of the SBC.

The use of all of the collected data and all of the analysis is to provide an understanding of the characteristics that are common among top DON recurring award winners. This is an opportunity for the SBC to model their DON business strategies after successful prime contractors and establishes a foundation to provide options to facilitate SBC participation in NOA and DON markets. This research was also used to establish a baseline of typical SBC participation in the entire DON market, once established this baseline was compared to NOA and ADP markets to determine if the SBC played a more or less prevalent role in NOA contracting (as NOA principles suggest) vs. DON contracting.

Analysis of federal contract data was used to determine whether there is a lack of SBC participation for DoD prime contracts independent of the service or product the SBC provided. The culmination of the data allowed the researcher to determine if the SBC is underutilized by the DON and to determine if NOA increases the likelihood that a SBC will participate for prime DON contracts. If claims of barriers are validated, this research will be used to form a foundation of suggestions on how to increase SBC participation in NOA and DON markets. If claims of barriers are contested this research will be used to assist the DON to overcome the perception of barriers to enter NOA and DON markets.

Retrieved from the Office of Small Business Programs (OSBP), the DoD goal for SBC prime contract monetary award for FY 2012 was twenty-two and half percent (Office of Small Business Programs, 2013). This will be used as an initial benchmark to determine if a certain market is succeeding in meeting prime contract goals.

Analysis in this chapter will focus on understanding if NOA is working as intended and allowing the DON to benefit from decreased costs and the maximization of potential innovation through increased SBC participation. This analysis will provide the

insight that is critical to understand the role of the SBC order to eliminate real or perceived barriers to entry to the federal market place and the options to facilitate increased SBC participation.

B. DON CONTRACTS \$6.5M OR HIGHER LARGE PRIME CONTRACTORS

1. Market Summary

In Fiscal Year (FY) 2012, the DON spent a total of \$66.5B on contracts for the DON market (all PSCs) where each individual contract was for \$6.5M or greater (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Contracts in excess of \$6.5M awarded to large prime contractors in the DON market accounted for a majority of the all the awards in this category. After reviewing the data it is noted that large primes accounted for \$58.3B of this award or eighty-eight percent of the total award. Large primes were awarded 1,015 contracts in excess of \$6.5M for FY12 (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Of the 1,015 contracts awarded by the DON to large primes in this category, 330 of the contracts were awarded to the top five large primes (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). The top five large prime contractors were awarded thirty-two percent of the total number of awarded contracts by the DON in this category.

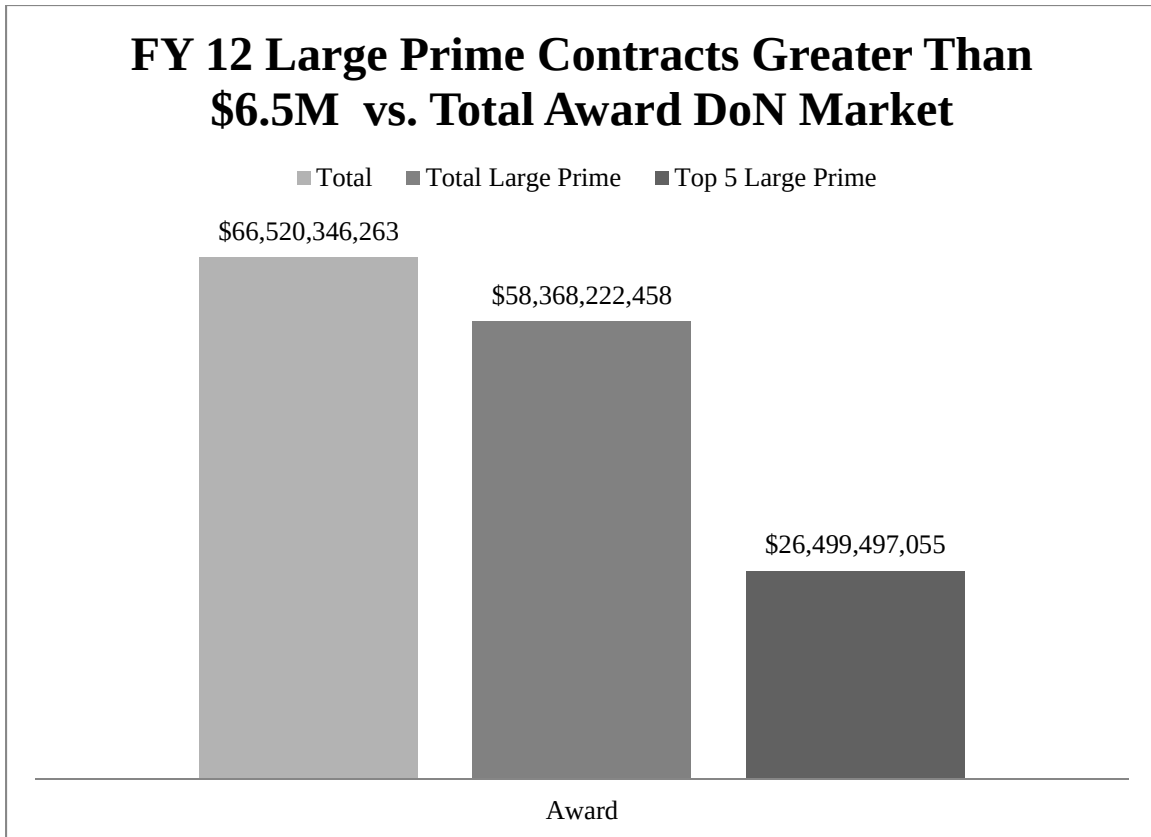


Figure 1. Large Prime Contracts \$6.5M or Greater Awarded vs. Total DON Awards \$6.5M or Greater FY12

The top five large primes account for \$26.5B of the total large prime award for this category and this constitutes forty-five percent of the eligible monetary award went to the top five companies. The data collected in this section produce results that suggest that the majority of the DON market is consistently awarded to a select few large primes. Figure 2 represents the top five awardees as a percentage of the total DON award that went to large primes in this category.

Top 5 Large Primes Awarded FY12 as a % of Total Large Prime Award \$6.5M or Greater DoN Market

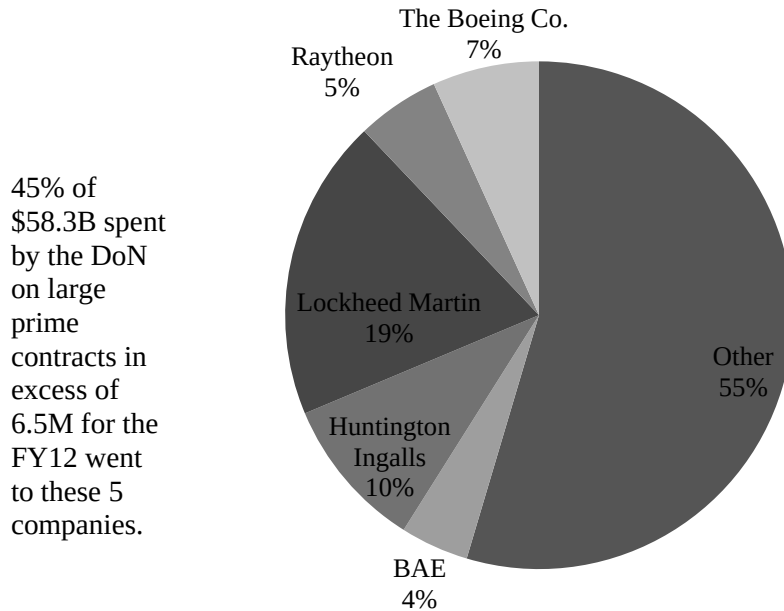


Figure 2. Top 5 Large Prime Award for Contracts \$6.5M or Greater as a Percentage of Total DON Award of Contracts \$6.5M or Greater DON Market

2. Profiles

The top five companies in this category along with the total dollar amount awarded to each company for FY12 are provided in Table 3. The following section is a brief profile of each company considered to be a top performer for this specific category. The purpose of this section is to highlight certain data in order to establish typical behaviors and business characteristics that are shared by the top performers for this category.

Company	Total Award FY 2012
Lockheed Martin Corporation	\$11,229,342,615
Huntington Ingalls Industries, INC.	\$5,677,939,464
The Boeing Company	\$3,964,886,119
Raytheon Company	\$3,085,809,225
BAE Systems, INC.	\$2,541,519,632

Table 3. Top 5 Large Primes for Contracts \$6.5M or Greater DON Market Amount Awarded

a. BAE Systems, INC.

BAE Systems, INC. is classified as a provider of navigation, search equipment and aircraft parts and equipment (Hoover's Company Records - In-depth Records, 2013). The reported net sales of BAE are \$14.4B for FY12 and BAE has 43,000 employees (Global Duns Market Identifiers, 2012).

BAE's total FY 12 Contracts for the DON market \$6.5M or greater was 58 awards (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, BAE was awarded 4,811 contracts by the DoD (United States Government, 2013). BAE's history with the DoD/DON dates back over a decade and the annual award total has ranged from hundreds of million dollars to annual DoD awards over a billion dollars (United States Government, 2013).

BAE is a recurring DoD/DON contracting partner that possesses a great deal of intellectual property. BAE has submitted 143 patents in the United States in the past 24 months (LexisNexis, 2013). BAE and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

b. Huntington Ingalls Industries, INC.

Huntington Ingalls Industries, INC. is classified as a ship-building and repair provider (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Huntington Ingalls are \$6.2B for FY12 and Huntington Ingalls has 38,000 employees (Global Duns Market Identifiers, 2012).

Huntington Ingalls' total FY 12 Contracts for the DON market \$6.5M or greater was 33 awards (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Huntington Ingalls was awarded 2,485 contracts by the DoD (United States Government, 2013). Huntington Ingalls history with the DoD/DON dates back over a decade (as Newport News and Ship Systems) and the annual award provided by the DoD has annually exceeded more than a billion dollars (United States Government, 2013).

Huntington Ingalls is a recurring DoD/DON contracting partner that does not rely on a great deal of intellectual property. Huntington Ingalls has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Huntington Ingalls and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

c. Lockheed Martin Corporation

The Lockheed Martin Corporation is classified as a provider of aircraft, aircraft manufacturing, aircraft parts and equipment (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Lockheed Martin are \$46.5B for FY12 and Lockheed has 123,000 employees (Global Duns Market Identifiers, 2012).

Lockheed's total FY 12 Contracts for the DON market \$6.5M or greater was 101 awards (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Lockheed was awarded 13,454 contracts by the DoD (United States Government, 2013). Lockheed's history with the DoD/DON dates back over a decade and the annual award total awarded by the DoD has annually been in the billions of dollars (United States Government, 2013).

Lockheed Martin is a recurring DoD/DON contracting partner that possesses a great deal of intellectual property. Lockheed Martin has submitted 100 patents in the United States in the past 24 months (LexisNexis, 2013). Lockheed Martin

has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

d. Raytheon Company

The Raytheon Company is classified as a provider of navigation, search equipment and communications equipment (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Raytheon are \$24.8B for FY12 and Raytheon has 71,000 employees (Global Duns Market Identifiers, 2012).

Raytheon's total FY 12 Contracts for the DON market \$6.5M or greater was 79 awards (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Raytheon was awarded 9,475 contracts by the DoD (United States Government, 2013). Raytheon's history with the DoD/DON dates back over a decade and consistently annual awards made by the DoD have been in billions of dollars (United States Government, 2013).

Raytheon is a recurring DoD/DON contracting partner that possesses a great deal of intellectual property. Raytheon has submitted 143 patents in the United States in the past 24 months (LexisNexis, 2013). Raytheon and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

e. The Boeing Company

The Boeing Company is classified as a provider of aircraft and aircraft manufacturing (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Boeing are \$68.7B for FY12 and Boeing has 171,700 employees (Global Duns Market Identifiers, 2012).

Boeing's total FY 12 Contracts for the DON market \$6.5M or greater was 59 awards (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Boeing was awarded 10,350 contracts by the DoD (United

States Government, 2013). Boeing's history with the DoD/DON dates back over a decade and the annual award made by the DoD total has consistently been in billions of dollars (United States Government, 2013).

Boeing is a recurring DoD/DON contracting partner that possesses a great deal of intellectual property. Boeing has submitted 271 patents in the United States in the past 24 months (LexisNexis, 2013). Boeing and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

3. Analysis

a. Design Disclosure Barrier

Analysis of the large prime DON market where each individual contract was for \$6.5M or greater suggests that there is a link between the number of patents submitted in the past two years and the net sales of the individual large prime. The Boeing Company leads the top five in this category with \$68.7B in net sales and 271 patents submitted and Huntington Ingalls is ranked five of five with \$6.2B in net sales and did not submit any patents. Eighty percent of the large primes awarded in this category are companies that have submitted over 100 patents in the US the past two years. Despite evidence to suggest that there is a link between intellectual property (patents) and net sales, there is no evidence to suggest that large primes are negatively impacted by design disclosure barriers that require disclosure of intellectual property to the DON.

b. Risk Mitigation Barrier

Each of the five large primes profiled in this category have established relationships with the DON that have been occurring for a decade and in some cases occurring for decades. This ongoing relationship suggests that there is evidence of the DON being risk adverse to new competition and as a result the DON consistently awards contracts to a limited number of recurring large primes in the DON market. The DON awarded thirty-two percent of the total number of awards and forty-five percent of the

total dollar award to the top five large primes. Conversely, all other large primes were awarded sixty-eight percent of the total number of awards (685 awards) and fifty-five percent of the total dollar award (\$32B). The DON's risk adverse practices are evident not only in the recurrence of use of the same prime contractors for over a decade(s) but these practices are also made evident through the significant reliance on only a few large primes for this category.

c. Prime Practices Barrier

There is evidence in this category of prime practices that prevent competition. The top five large primes in this category each experienced increasing award totals over the past decade. This behavior indicates that there is a propensity for large primes to consistently seek more contract awards and to be awarded at an increasing rate as the fluency with DoD/DON business practices increases.

This prime practice barrier behavior is influenced by the design disclosure barrier and the risk mitigation barrier. As large primes are deemed less risk adverse (through recurring relationships) with the DoD/DON there appears to be a link to increased awards for top providers. Increased award totals allow large primes to have more exposure to what intellectual property has been previously divulged by other companies due to disclosure requirements. The evidence of continued increases in annual award amounts to a limited number of top large primes indicates that the large prime is able to capitalize on limited competition, through typical prime practices that constitute prime practice barriers to potential new competitors.

C. DON CONTRACTS \$6.5M OR HIGHER SBC PRIME CONTRACTORS

1. Market Summary

The DON spent a total of \$66.5B on contracts for the DON market (all PSCs) where each individual contract was for \$6.5M or greater (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Contracts in excess of \$6.5M awarded to SBC Prime Contractors in the DON market accounted for only three percent of all the awards in this category. After reviewing the data it is noted that

SBC Primes accounted for \$2.3B of this award or three percent of the total award. SBC Primes were awarded 137 contracts in excess of \$6.5M for FY12 (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Of the 137 contracts awarded by the DON to SBC Primes in this category 23 of the contracts were awarded to the top five SBC Primes (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). The top five SBC Prime Contractors were awarded seventeen percent of the total number of awarded contracts by the DON in this category.

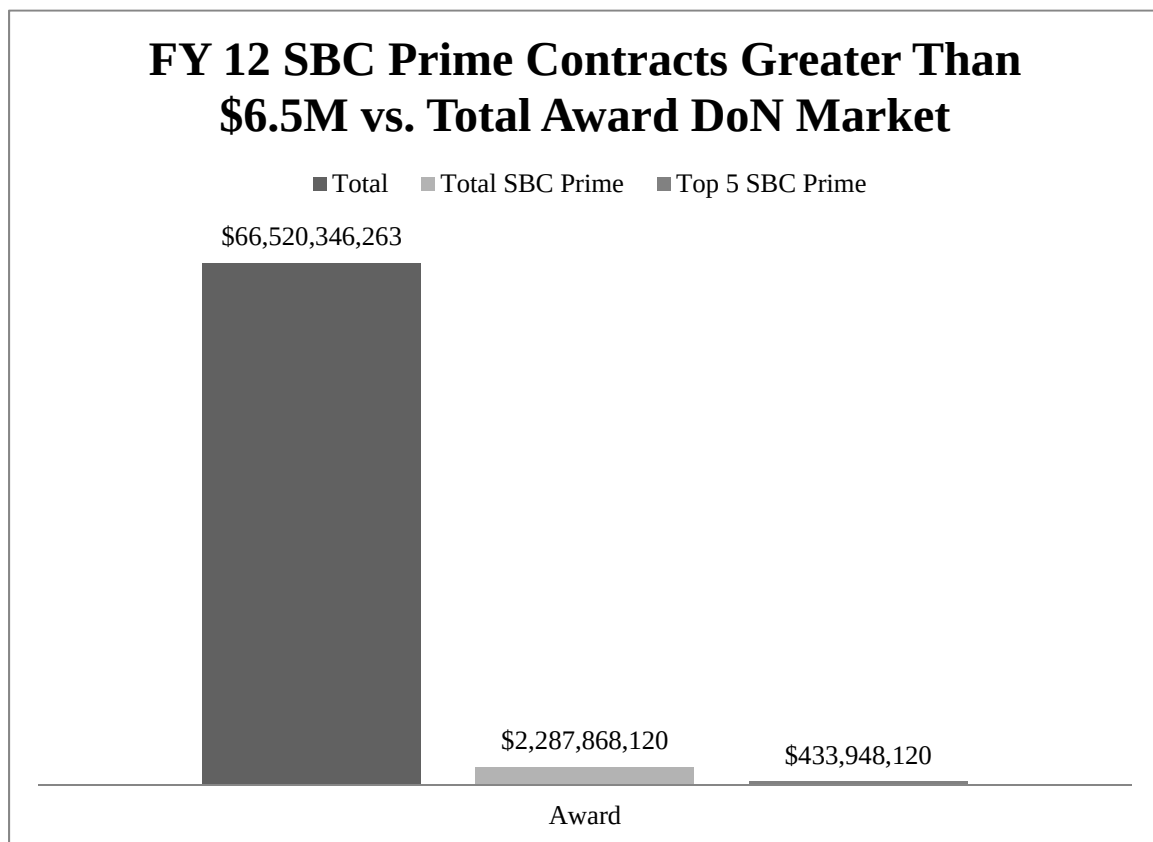


Figure 3. SBC Prime Contracts \$6.5M or Greater Awarded vs. Total DON Awards \$6.5M or Greater FY12

The top five SBC Primes account for \$434M of the total SBC Prime award for this category and this constitutes nineteen percent of the eligible monetary award went to the top five companies. The data collected in this section produce results that suggest

that the DON offers contracts to diverse group of SBC Primes in the DON market. Figure 4 represents the top five awardees as a percentage of the total DON award that went to SBC Primes in this category.

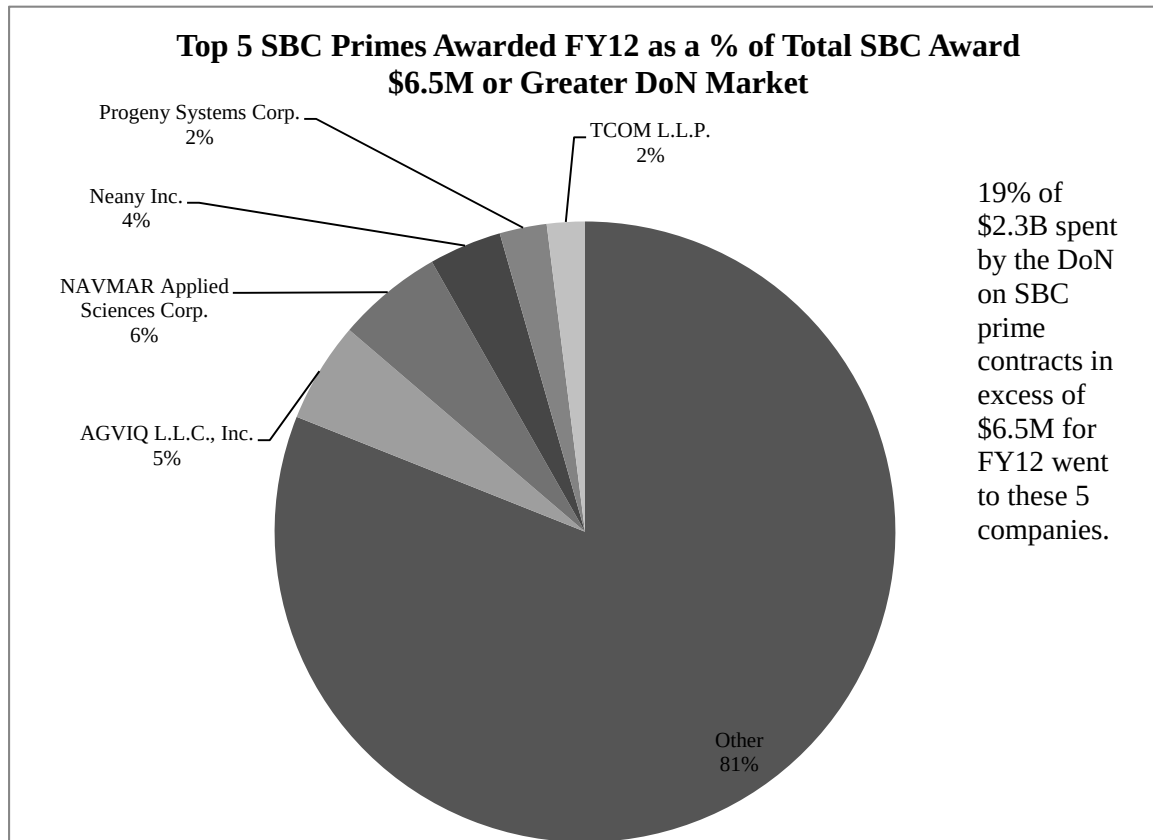


Figure 4. Top 5 SBC Award for Contracts \$6.5M or Greater as a Percentage of Total DON Award of Contracts \$6.5M or Greater awarded to all SBCs

2. Profiles

The top five companies in this category along with the total dollar amount awarded to each company for FY12 are provided in Table 4. The following section is a brief profile of each company considered to be a top performer for this specific category. The purpose of this section is to highlight certain data in order to establish typical behaviors and business characteristics that are shared by the top performers for this category.

Company	Amount Awarded
NAVMAR Applied Sciences Corporation	\$126,334,282
AGVIQ LLC., INC.	\$119,801,722
Neany INC.	\$86,533,288
Progeny Systems Corporation	\$56,193,031
TCOM LLP	\$45,085,797

Table 4. Top 5 SBCs for Prime Contracts over \$6.5M or Greater DON market Amount Awarded

a. AGVIQ LLC INC.

AGVIQ, LLC INC. is classified as a business and environmental consulting service (Hoover's Company Records - In-depth Records, 2013). The reported net sales AGVIQ are \$6.2M for FY12 and AGVIQ has 60 employees (Global Duns Market Identifiers, 2012).

AGVIQ's total FY 12 Contracts for the DON market \$6.5M or greater was three awards (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, AGVIQ was awarded 123 contracts by the DoD (United States Government, 2013). AGVIQ's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$2.8M in 2000 to \$40.1M in 2012 (United States Government, 2013).

AGVIQ is a recurring DoD/DON partner that does not rely on a great deal of intellectual property. AGVIQ has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). AGVIQ and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

b. NAVMAR Applied Sciences Corporation

NAVMAR Applied Sciences Corporation is classified as a provider of commercial physical research and engineering services (Hoover's Company Records - In-

depth Records, 2013). The reported net sales of NAVMAR are \$27.2M for FY12 and NAVMAR has 170 employees (Global Duns Market Identifiers, 2012).

NAVMAR's total FY 12 Contracts for the DON market \$6.5M or greater was five awards (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, NAVMAR was awarded 121 contracts by the DoD. (United States Government, 2013). NAVMAR's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$12M in 2000 to \$233.8M in 2012 (United States Government, 2013).

NAVMAR is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. NAVMAR has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). NAVMAR and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

c. Neany INC.

Neany INC. is classified as a provider of navigation and search equipment (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Neany are \$7.4M for FY12 and Neany has 51 employees (Global Duns Market Identifiers, 2012).

Neany's total FY 12 Contracts for the DON market \$6.5M or greater was seven awards (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Neany was awarded 43 contracts by the DoD (United States Government, 2013). Neany's history with the DoD/DON dates back to 2004, the annual award total has ranged from \$2M in 2004 to \$117.7M in 2012 (United States Government, 2013).

Neany is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Neany has not submitted any patents in the United

States in the past 24 months (LexisNexis, 2013). Neany and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

d. Progeny Systems Corporation

The Progeny Systems Corporation is classified as a provider of computer integrated systems design and computer peripheral equipment (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Progeny are \$50M for FY12 and Progeny has 148 employees (Global Duns Market Identifiers, 2012).

Progeny's total FY 12 Contracts for the DON market \$6.5M or greater was four awards (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Progeny was awarded 246 contracts by the DoD (United States Government, 2013). Progeny's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$5.8M in 2000 to \$100.9M in 2012 (United States Government, 2013).

Progeny is a recurring DoD/DON contracting partner that possesses some intellectual property. Progeny has submitted two patents in the United States in the past 24 months (LexisNexis, 2013). Progeny and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

e. TCOM LLP

TCOM LLP is classified as a provider of engineering services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of TCOM are \$114 for FY12 and TCOM has 337 employees (Global Duns Market Identifiers, 2012).

TCOM's total FY 12 Contracts for the DON market \$6.5M or greater was four awards (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, TCOM was awarded 43 contracts by the DoD (United States

Government, 2013). TCOM's history with the DoD/DON dates back a decade and the annual award total has ranged from \$3.3M in 2002 to \$82M in 2012 (United States Government, 2013).

TCOM is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. TCOM has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). TCOM and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

3. Analysis

a. Design Disclosure Barrier

The SBC Prime DON market where each individual contract was for \$6.5M or greater suggests that there is a link between the number of patents submitted in the past two years and the number of awards awarded to the top SBCs. Progeny was the only company to have submitted a patent in the past two years (both IT related) that ranked in the top five SBC Primes for this category. The majority of the top SBCs in this category did not submit patents in the past two years; this suggests that to be a successful the SBC in this category the company does not need to rely heavily on the use of intellectual property. This behavior may also suggest that the preference of the companies who possess or rely heavily on intellectual property is to not participate in DON markets. Therefore a design disclosure barrier for this category is a distinct possibility.

b. Risk Mitigation Barrier

Four of the five SBC Primes profiled in this category have established relationships with the DoD/DON that have been occurring for a decade or more. This ongoing relationship suggests that there is evidence of the DON being risk adverse and consistently awarding contracts to a limited number of recurring SBC Primes. However, there is data to suggest that the SBC Market is awarded on a relatively competitive basis despite evidence of a limited risk mitigation barrier. The DON awarded seventeen

percent of the total number of awards and nineteen percent of the total dollar award to the top five SBC Primes. Conversely, all other SBC Primes were awarded eighty-three percent of the total number of awards and eighty-one percent of the total dollar award. The DON's risk-adverse practices are evident in the recurring of the same prime contractors for over a decade; however, these practices do not appear to present barriers to competition in this category.

c. Prime Practices Barrier

There is evidence in this category of prime practices that negatively impact competition creating a prime practice barrier. The top five SBC Primes in this category each experienced increasing award totals over the course of the years business has been conducted with the DoD/DON. This behavior indicates that there is a propensity for SBC Primes to consistently seek more contract awards and to be awarded at an increasing rate as the familiarity to DoD/DON business practices increases.

D. NOA CONTRACTS \$6.5M OR HIGHER LARGE PRIME CONTRACTORS

1. Market Summary

The DON spent a total of \$1.767B on contracts for the NOA market (PSCs 70 & D) where each individual contract was for \$6.5M or greater (United States Government, 2013). Contracts in excess of \$6.5M awarded to large prime contractors in the NOA market accounted for a majority of the all the awards in this category. After reviewing the data it is noted that large primes accounted for \$1.737B of this award or ninety-seven percent of the total award. Large primes were awarded 75 contracts in excess of \$6.5M for FY12 (United States Government, 2013). Of the 75 contracts awarded by the DON to large primes in this category 48 of the contracts were awarded to the top five large primes (United States Government, 2013). The top five large prime contractors were awarded sixty-four percent of the total number of awarded contracts by the DON in this category.

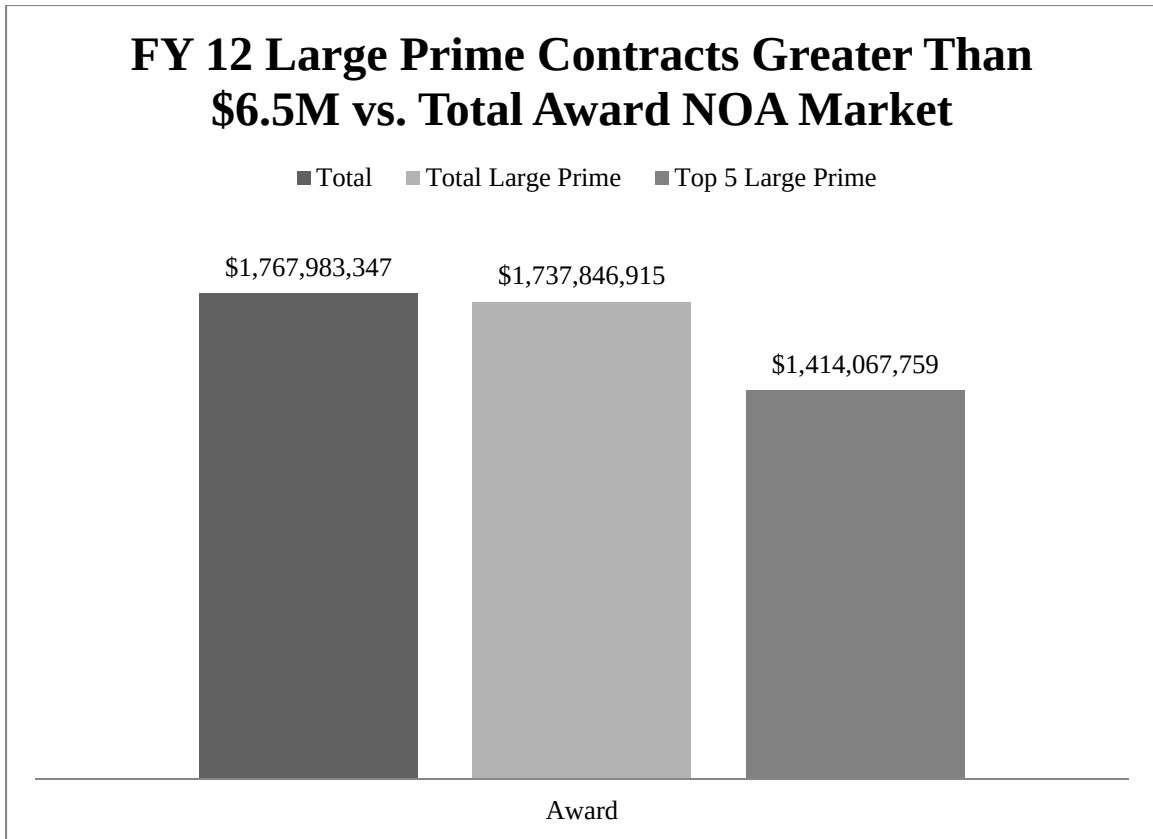


Figure 5. Large Prime Contracts Greater Than \$6.5M vs. Total Award NOA Market

The top five large primes account for \$1.4B of the total large prime award for this category and this constitutes eighty-two percent of the eligible monetary award went to the top five companies. The data collected in this section produce results that suggest that the majority of the NOA market is consistently awarded to a select few large primes. Figure 6 represents the top five awardees as a percentage of the total NOA award that went to large primes in this category.

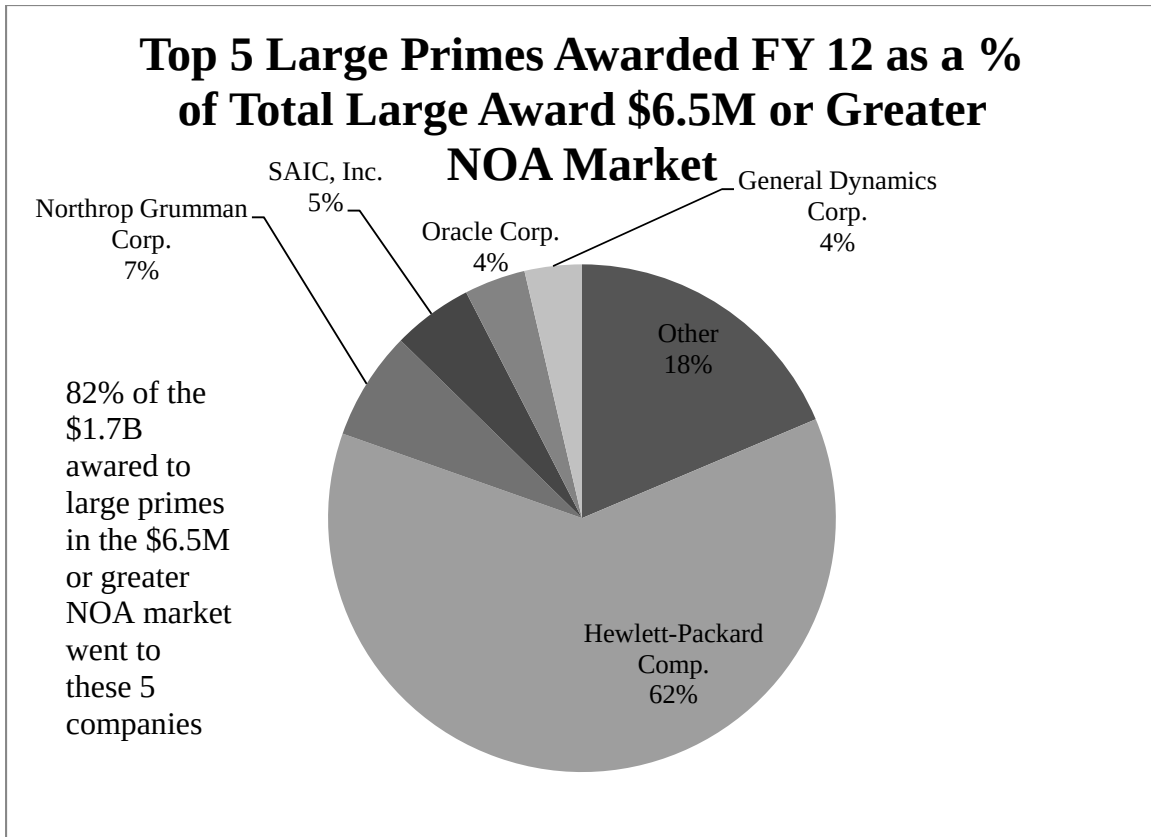


Figure 6. Top 5 Large Primes Awarded FY12 as a Percentage of Total Large Award \$6.5M or Greater NOA Market

2. Profiles

The top five companies in this category along with the total dollar amount awarded to each company for FY12 are provided in Table 5. The following section is a brief profile of each company considered to be a top performer for this specific category. The purpose of this section is to highlight certain data in order to establish typical behaviors and business characteristics that are shared by the top performers for this category.

Company	Amount Awarded
Hewlett-Packard Company	\$1,073,526,647
Northrop Grumman Company	\$120,519,650
SAIC, INC.	\$88,924,896
Oracle Corporation	\$67,838,701
General Dynamics Corporation	\$63,257,865

Table 5. Top 5 Large Primes \$6.5M or Greater NOA Market Amount Awarded

a. Hewlett-Packard Company

The Hewlett-Packard Company is classified as a provider of electronic computers, computer storage devices, computer peripheral equipment, investment advice, computer programming services, pre-packaged software, computer integrated systems design, data processing and preparation and computer related services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Hewlett-Packard are \$120.3B for FY12 and Hewlett Packard has 324,600 employees (Global Duns Market Identifiers, 2012).

Hewlett-Packard's total FY 12 contracts for the NOA market \$6.5M or greater was 26 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Hewlett-Packard was awarded 2,379 contracts by the DoD (United States Government, 2013). Hewlett-Packard's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$14.7M in 2000 to \$138.3M in 2012 (United States Government, 2013).

Hewlett-Packard is a recurring DoD/DON contracting partner that possesses a great deal of intellectual property. Hewlett-Packard has submitted 288 patents in the United States in the past 24 months (LexisNexis, 2013). Hewlett-Packard has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

b. Northrop Grumman Corporation

The Northrop Grumman Corporation is classified as a provider of navigation, search equipment and aircraft parts and equipment (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Northrop Grumman are \$26.4B for FY12 and Northrop Grumman has 72,500 employees (Global Duns Market Identifiers, 2012).

Northrop Grumman's total FY 12 Contracts for the NOA market \$6.5M or greater was five awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Northrop Grumman was awarded 11,763 contracts by the DoD (United States Government, 2013). Northrop Grumman's history with the DoD/DON dates back over a decade and the annual award totals have consistently been in the billions of dollars (United States Government, 2013).

Northrop Grumman is a recurring DoD/DON contracting partner that possesses intellectual property. Northrop Grumman has submitted 36 patents in the United States in the past 24 months (LexisNexis, 2013). Northrop Grumman and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

c. SAIC INC.

SAIC INC. is classified as a provider of computer integrated system design, electrical work, computer programming services, pre-packaged software, computer related services and engineering services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of SAIC are \$10.6B for FY12 and SAIC has 41,100 employees (Global Duns Market Identifiers, 2012).

SAIC's total FY 12 contracts for the NOA market \$6.5M or greater was six awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, SAIC was awarded 6,425 contracts by the DoD (United States Government, 2013). SAIC's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$281.6M in 2000 to \$3.4B in 2012 (United States Government, 2013).

SAIC is a recurring DoD/DON contracting partner that possesses limited intellectual property. SAIC has submitted three patents in the United States in the past 24 months (LexisNexis, 2013). SAIC and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

d. Oracle Corporation

The Oracle Corporation classified as a provider of pre-packaged software, electronic computers, computer storage devices, computer programming services and computer integrated systems design (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Oracle are \$37.1B for FY12 and Oracle has 115,000 employees (Global Duns Market Identifiers, 2012).

Oracle's total FY 12 Contracts for the NOA market \$6.5M or greater was six awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Oracle was awarded 1,051 contracts by the DoD (United States Government, 2013). Oracle's history with the DoD/DON dates back over a decade and the annual awards have consistently been in the hundreds of millions of dollars (United States Government, 2013).

Oracle is a recurring DoD/DON contracting partner that possesses a great deal of intellectual property. Oracle has submitted 268 patents in the United States in the past 24 months (LexisNexis, 2013). Oracle has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

e. General Dynamics Corporation

The General Dynamics Corporation is classified as a ship-building and repair provider (Hoover's Company Records - In-depth Records, 2013). The reported net sales of General Dynamics are \$32.7B for FY12 and General Dynamics has 95,100 employees (Global Duns Market Identifiers, 2012).

General Dynamics' total FY 12 Contracts for the NOA market \$6.5M or greater was five awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, General Dynamics was awarded 8,961 contracts by the DoD (United States Government, 2013). General Dynamics' history with the DoD/DON dates back over a decade and the annual award total has been consistently in billions of dollars (United States Government, 2013).

General Dynamics is a recurring DoD/DON contracting partner that possesses limited intellectual property. General Dynamics has submitted nine patents in the United States in the past 24 months (LexisNexis, 2013). General Dynamics and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

3. Analysis

a. Design Disclosure Barrier

The large prime NOA market where each individual contract was for \$6.5M or greater suggests that there is a link between the number of patents submitted in the past two years and the successfulness of the top five large primes in this category. Each large prime in the top five of this category has submitted patents in the past two years. The three IT classified companies (Hewlett-Packard, SAIC and Oracle) accounted for ninety-three percent of the patents submitted by the top five large primes in this category. This behavior suggests that large IT classified companies are especially dependent upon intellectual property in the NOA market.

This evidence points to a necessity for would be large primes to possess a significant amount of intellectual property in order to be a viable competitor in this category of the NOA market. There is no evidence to suggest that current top large primes are negatively impacted by design disclosure barriers that require disclosure of intellectual property to the DON.

b. Risk Mitigation Barrier

Each of the five large primes profiled in this category have established relationships with the DoD/DON that have been occurring for a decade and in some cases occurring for decades. This ongoing relationship suggests that there is evidence of the DON being risk adverse and consistently awarding contracts to a limited number of recurring large primes. The DON awarded sixty-four percent of the total number of awards and eighty-two percent of the total dollar award to the top five large primes. Conversely all other large primes were awarded thirty-six percent of the total number of awards and eighteen percent of the total dollar award. The DON's risk adverse practices are evident not only the recurrence in the use of the same prime contractors for over a decade but these practices are also made evident through the significant reliance on only a few large primes for this category.

c. Prime Practices Barrier

There is evidence in this category of prime practices that prevent competition. The top top five large primes in this category each experienced increasing award totals over the past decade. This one hundred percent behavior indicates that there is a propensity for large primes to consistently seek more contract awards and to be awarded at an increasing rate as the fluency to DoD/DON business practices increases. This behavior is also influenced by the design disclosure barrier and the risk mitigation barrier. As large primes are deemed less risk adverse to the DoD/DON there appears to be a link to increased awards. Additional business knowledge and award totals allow the large primes to have more exposure to what intellectual property has been divulged by other companies, a continued increase in award amounts indicates that the familiar large prime is able to capitalize on limited competition, through typical prime practices.

E. NOA CONTRACTS \$6.5M OR HIGHER SBC PRIME CONTRACTORS

1. Market Summary

The DON spent a total of \$1.767B on contracts for the NOA market (PSCs 70 & D) where each individual contract was for \$6.5M or greater (United States Government,

2013). Contracts in excess of \$6.5M awarded to SBC prime contractors in the NOA market accounted for a minority of the all the awards in this category. After reviewing the data it is noted that SBC primes accounted for \$46.5M of this award or three percent of the total award. SBC Primes were awarded five contracts in excess of \$6.5M for FY12 (United States Government, 2013). Of the five contracts awarded by the DON to SBC Primes in this category five of the contracts were awarded to the top four SBC Primes (United States Government, 2013). The top four SBC Prime Contractors were awarded one hundred percent of the total number of awarded contracts by the DON in this category.

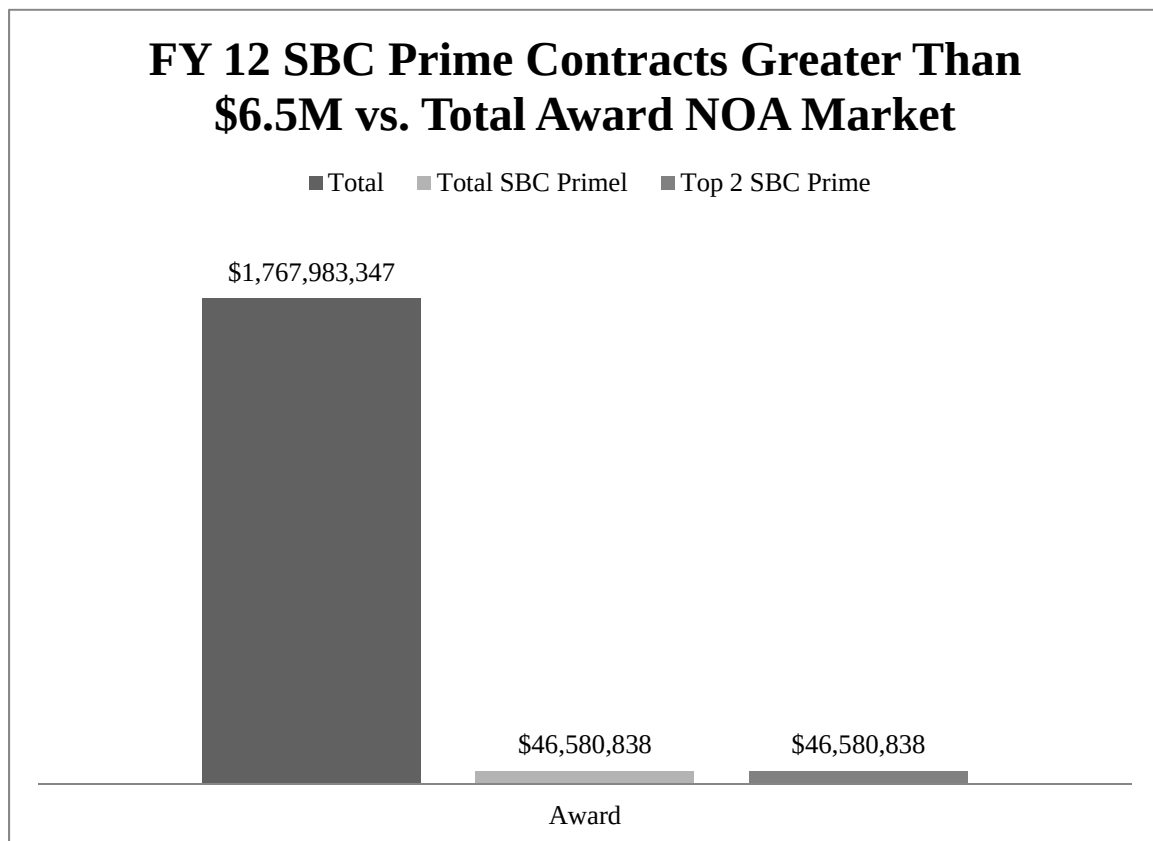


Figure 7. SBC Prime Contracts Greater Than \$6.5M vs. Total Award NOA Market

The top four SBC primes account for \$46.5M of the total SBC prime award for this category and this constitutes one hundred percent of the eligible monetary award went to the top four companies. The data collected in this section produce results that

suggest that the NOA market lacks competition provided by the participation of the SBC. This data allows suggests that the NOA SBC market lacks competitors. Figure 8 represents the top four awardees as a percentage of the total DON award that went to SBC primes in this category.

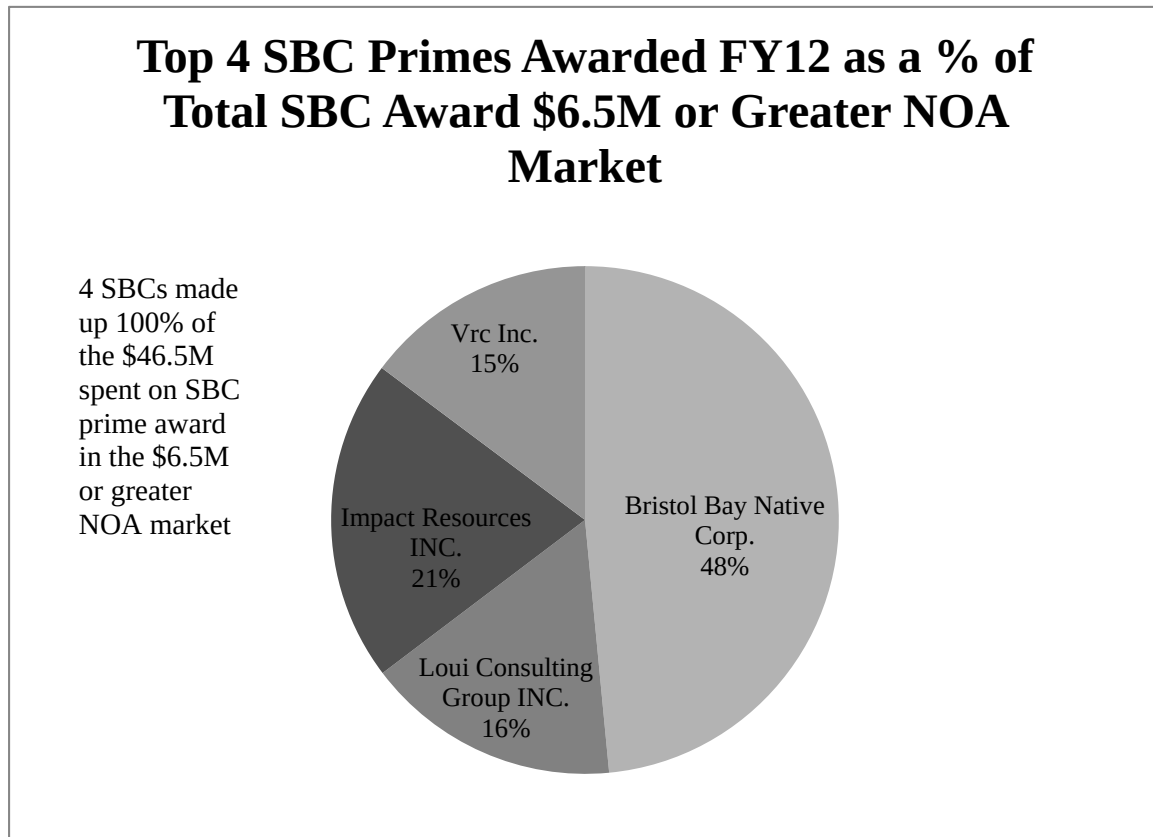


Figure 8. Top 4 SBC Primes Awarded FY12 as a Percentage of Total SBC Award \$6.5M or Greater NOA Market

2. Profiles

The top four companies in this category along with the total dollar amount awarded to each company for FY12 are provided in Table 6. The following section is a brief profile of each company considered to be a top performer for this specific category. The purpose of this section is to highlight certain data in order to establish typical behaviors and business characteristics that are shared by the top performers for this category.

Company	Amount Awarded
Bristol Bay Native Corporation	\$22,582,954
Impact Resources INC.	\$9,562,047
Loui Consulting Group INC.	\$7,553,478
VRC INC.	\$6,882,359

Table 6. Top 4 SBC Primes Award \$6.5M or Greater NOA Market Amount Awarded

a. Bristol Bay Native Corporation

The Bristol Bay Native Corporation classified as a provider of hotels and motels and is the parent company for numerous other holding companies (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Bristol Bay are \$1.2B for FY12 and Bristol Bay has 135 employees (Global Duns Market Identifiers, 2012).

Bristol Bay's total FY 12 Contracts for the NOA market \$6.5M or greater was two awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Bristol Bay was awarded 25 contracts by the DoD (United States Government, 2013). Bristol Bay's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$27.9K in 2001 to \$195.7K in 2012.

Bristol Bay is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Bristol Bay has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Bristol Bay and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

b. Impact Resources INC.

Impact Resources INC. is classified as a provider of computer programing services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Impact Resources are \$330K for FY12 and Impact Resources has seven employees (Global Duns Market Identifiers, 2012).

Impact Resources' total FY 12 Contracts for the NOA market \$6.5M or greater was one award (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Impact Resources was awarded 22 contracts by the DoD (United States Government, 2013). Impact Resources' history with the DoD/DON dates back a decade and the annual award total has ranged from \$921.4K in 2002 to \$18.3M in 2012 (United States Government, 2013).

Impact Resources is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Impact Resources has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Impact Resources and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

c. Loui Consulting Group INC.

The Loui Consulting Group INC. is classified as a provider of computer related services and marketing consulting services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Loui Consulting are \$2M for FY12 and Loui Consulting has 16 employees (Global Duns Market Identifiers, 2012).

Loui Consulting's total FY 12 Contracts for the NOA market \$6.5M or greater was one award (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Loui Consulting was awarded 17 contracts by the DoD (United States Government, 2013). Loui Consulting's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$1.1M in 2000 to \$10.5M in 2012 (United States Government, 2013).

Loui Consulting is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Loui Consulting has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Loui Consulting and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

d. VRC INC.

VRC INC. is classified as a provider of management consulting services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of VRC are \$11.4M for FY12 and VRC has 49 employees (Global Duns Market Identifiers, 2012).

VRC's total FY 12 Contracts for the NOA market \$6.5M or greater was one award (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, VRC was awarded 144 contracts by the DoD (United States Government, 2013). VRC's history with the DoD/DON dates back to 2004 and the annual award totals have ranged from \$37.6K in 2004 to \$94M in 2012 (United States Government, 2013).

VRC is a recurring DoD/DON contracting partner that possesses a great deal of past intellectual property. VRC has submitted 46 total patents in the United States in VRC's history; however, VRC has not submitted any patents in the US over the past 24 months (LexisNexis, 2013). VRC and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

3. Analysis

a. Design Disclosure Barrier

The SBC prime NOA market where each individual contract was for \$6.5M or greater suggests that there is a design disclosure barrier that prevents companies that possess intellectual property from participation in this category of the NOA market. Unlike the large prime in this category of the NOA market the SBCs that participate have no reliance on intellectual property. The absence of patents submitted by the SBC in this category is evidence that design disclosure barriers exist and limit competition. The stark contrast from the large prime one hundred percent patent submission in this category vs. the zero percent SBC submission in this category supports the claim that would be SBC participants that possess intellectual property prefer to not participate in this category of NOA markets.

b. Risk Mitigation Barrier

The seventy-five percent of the SBCs awarded contracts in this category have established relationships with the DoD/DON that have been occurring for a decade and in some cases occurring for decades. This ongoing relationship suggests that there is evidence of the DON being risk adverse and consistently awarding contracts to a limited number of recurring SBC primes in this category of the NOA market. The DON awarded one hundred percent of the total number of awards and one hundred percent of the total dollar award to the top four SBC primes.

The risk mitigation barrier is exposed on two levels in this category of the NOA market. The first is that the SBC only is awarded three percent of the eligible monetary award and six percent of the total number of awards in this category of the NOA market. The second is that there are only four SBC companies awarded contracts in this category of the NOA market. This category of the NOA market is clearly biased (ninety-seven percent of the award) and the DON consistently awards the majority of the contracts in this category of the NOA market to large primes and the remaining few contracts are consistently awarded to the same top SBCs in this category of the NOA market.

c. Prime Practices Barrier

There is striking evidence in this category of prime practices that prevent competition. The top top four SBC primes in this category of the NOA market each experienced increasing award totals over the duration of their participation with the DoD/DON. This behavior indicates that there is a propensity for SBC primes to consistently seek more contract awards and to be awarded at an increasing rate as the in this category of the NOA market. The prime practice barrier is best demonstrated by VRC INC., increase in contract revenue from \$37.6K in 2004 to \$94M in 2012 (United States Government, 2013).

F. ADP CONTRACTS \$6.5M OR HIGHER LARGE PRIME CONTRACTORS

1. Market Summary

The DON spent a total of \$54M on contracts for the ADP market (PSC 7030) where each individual contract was for \$6.5M or greater (United States Government, 2013). Contracts in excess of \$6.5M awarded to large prime contractors in the ADP market accounted for all the awards in this category. After reviewing the data it is noted that large primes accounted for \$54M of this award or one hundred percent of the total award. Large primes were awarded six contracts in excess of \$6.5M for FY12 (United States Government, 2013). Of the six contracts awarded by the DON to large primes in this category six of the contracts were awarded to the top four large primes (United States Government, 2013). The top four large prime contractors were awarded one hundred percent of the total number of awarded contracts by the DON in this category.

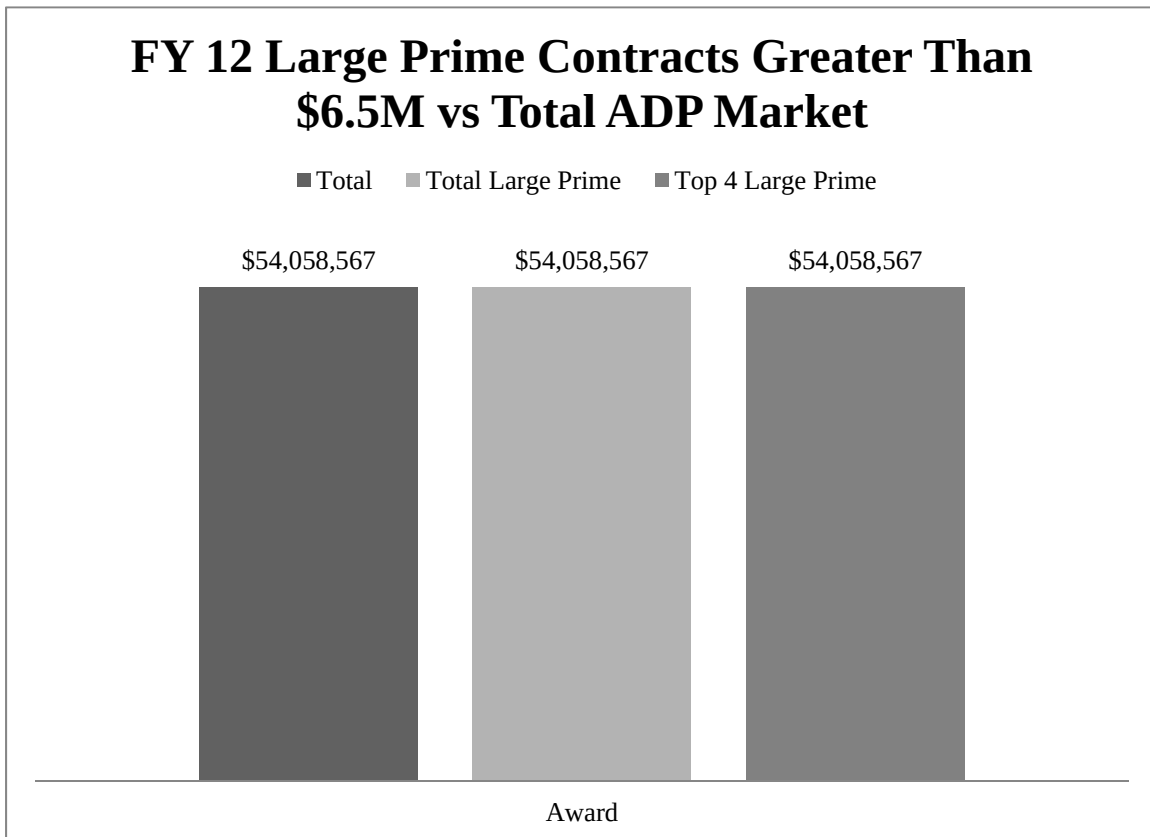


Figure 9. Large Prime Contracts Greater Than \$6.5M vs. Total Award ADP Market

The top four large primes account for \$54M of the total large prime award for this category and this constitutes one hundred percent of the eligible monetary award went to the top four companies. The data collected in this section produce results that suggest that contracts in the ADP market over \$6.5M are consistently awarded to a select few large primes. Figure 10 represents the top four awardees as a percentage of the total ADP award that went to large primes in this category

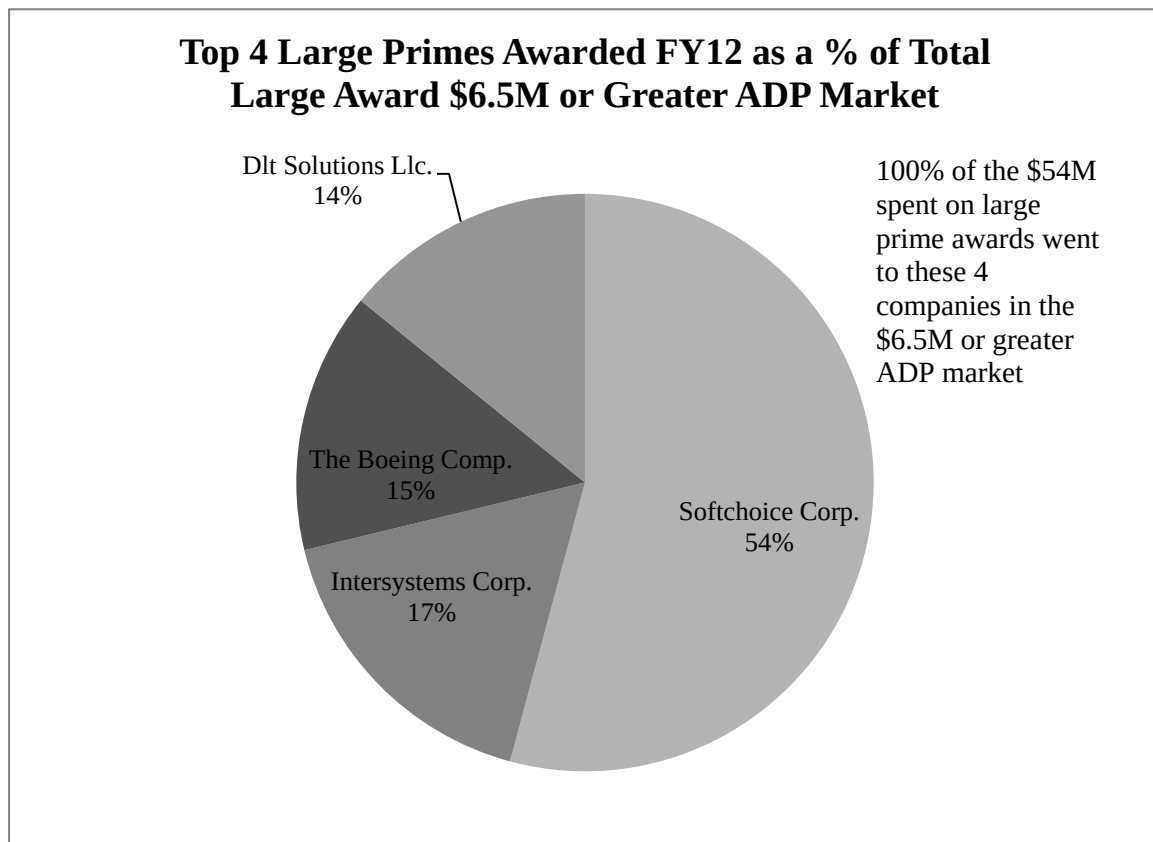


Figure 10. Top 4 Large Primes Awarded FY12 as a Percentage of Total Large Award \$6.5M or Greater ADP Market

2. Profiles

The top four companies in this category along with the total dollar amount awarded to each company for FY12 are provided in Table 7. The following section is a brief profile of each company considered to be a top performer for this specific category. The purpose of this section is to highlight certain data in order to establish typical

behaviors and business characteristics that are shared by the top performers for this category.

Company	Amount Awarded
Softchoice Corporation	\$29,291,846
Intersystems Corporation	\$9,219,000
The Boeing Company	\$7,900,000
DLT Solutions LLC	\$7,647,721

Table 7. Top 4 Large Primes Awarded \$6.5M or Greater ADP Market Amount Awarded

a. *Softchoice Corporation*

The Softchoice Corporation is classified as a provider of computer peripherals, software and computer integrated systems design (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Softchoice are \$999.4M for FY12 and Softchoice has 1,112 employees (Global Duns Market Identifiers, 2012).

Softchoice's total FY 12 Contracts for the ADP Market \$6.5M or greater was three awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Softchoice was awarded 356 contracts by the DoD (United States Government, 2013). Softchoice's history with the DoD/DON dates back a decade and the annual award total has ranged from \$544K in 2002 to \$71.1M in 2012 (United States Government, 2013).

Softchoice is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Softchoice has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Softchoice and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

b. *Intersystems Corporation*

The Intersystem Corporation is classified as a provider of computer programming services and pre-packaged software (Hoover's Company Records - In-depth

Records, 2013). The reported net sales of Intersystems are \$385M for FY12 and Intersystems has 500 employees (Global Duns Market Identifiers, 2012).

Intersystems' total FY 12 Contracts for the ADP market \$6.5M or greater was one award (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Intersystems was awarded 5 contracts by the DoD (United States Government, 2013). Intersystems' history with the DoD/DON dates back over a decade and the annual award total has ranged from \$2.7M in 2000 to \$9.2M in 2012 (United States Government, 2013).

Intersystems is a recurring DoD/DON contracting partner that possesses limited intellectual property. Intersystems has submitted one patent in the United States in the past 24 months (LexisNexis, 2013). Intersystems and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

c. The Boeing Company

The Boeing Company is classified as a provider of aircraft, navigation and search equipment (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Boeing are \$68.7B for FY12 and Boeing has 171,700 employees (Global Duns Market Identifiers, 2012).

Boeing's total FY 12 Contracts for the ADP Market \$6.5M or greater was one award (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Boeing was awarded 10,350 contracts by the DoD (United States Government, 2013). Boeing's history with the DoD/DON dates back over a decade and the annual award total has been in the billions of dollars (United States Government, 2013).

Boeing is a recurring DoD/DON contracting partner that possesses a great deal of intellectual property. Boeing has submitted 271 patents in the United States in the past 24 months (LexisNexis, 2013). Boeing and has consistently benefitted as evidenced

by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

d. *DLT Solutions LLC*

DLT Solutions is classified as a provider of computer programming services and computer integrated system design (Hoover's Company Records - In-depth Records, 2013). The reported net sales of DLT Solutions are \$150K for FY12 and DLT Solutions has 250 employees (Global Duns Market Identifiers, 2012).

DLT's total FY 12 Contracts for the ADP Market \$6.5M or greater was one award (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, DLT was awarded 1,134 contracts by the DoD (United States Government, 2013). DLT's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$12.4M in 2000 to \$132M in 2012 (United States Government, 2013).

DLT is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. DLT has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). DLT and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

3. Analysis

a. *Design Disclosure Barrier*

Analysis of the top four large primes in this category of the ADP market suggests that there is no link between the number of patents submitted in the past two years and a design disclosure barrier. Intersystems Corporation and The Boeing Company each submitted patents in the past two years; on the other hand the Softchoice Corporation and DLT Solutions LLC., submitted zero patents the past two years. This 50/50 split suggests that there are not design disclosure barriers that prevent competition in this category of the ADP market.

b. Risk Mitigation Barrier

Each of the four large primes profiled in this category have established relationships with the DoD/DON that have been occurring for a decade and in some cases occurring for decades. This ongoing relationship suggests that there is evidence of the DON being risk adverse and consistently awarding contracts to a limited number of recurring large primes. The DON awarded one hundred percent of the total number of awards and one hundred percent of the total dollar award to the top four large primes. The DON's risk mitigation barrier is made evident by the employment of only four large primes, each possessing over a decade of experience in DoD/DON participation

c. Prime Practices Barrier

There is evidence in this category of prime practice barriers that prevent competition. The top four large primes in this category each experienced increasing award totals over the past decade. This behavior indicates that there is a propensity for large primes to consistently seek more contract awards and to be awarded at an increasing rate as the familiarity to DoD/DON business practices increases. This behavior is also influenced by the risk mitigation barrier. As large primes are deemed less risk adverse to the DoD/DON there appears to be a link to increased awards. Evidence of a price practice barrier allows the familiar large prime to capitalize on limited competition in this category of the ADP market.

G. ADP CONTRACTS \$6.5M OR HIGHER SBC PRIME CONTRACTORS

1. Market Summary

The DON spent \$54M on contracts for the ADP Market (PSC 7030) where each individual contract was for \$6.5M or greater (United States Government, 2013). Contracts in excess of \$6.5M awarded to SBC prime contractors in the ADP market accounted for none of the all the awards in this category. After reviewing the data it is noted that SBC primes did not account for any of these. Large primes were awarded six contracts in excess of \$6.5M for FY12 (United States Government, 2013).

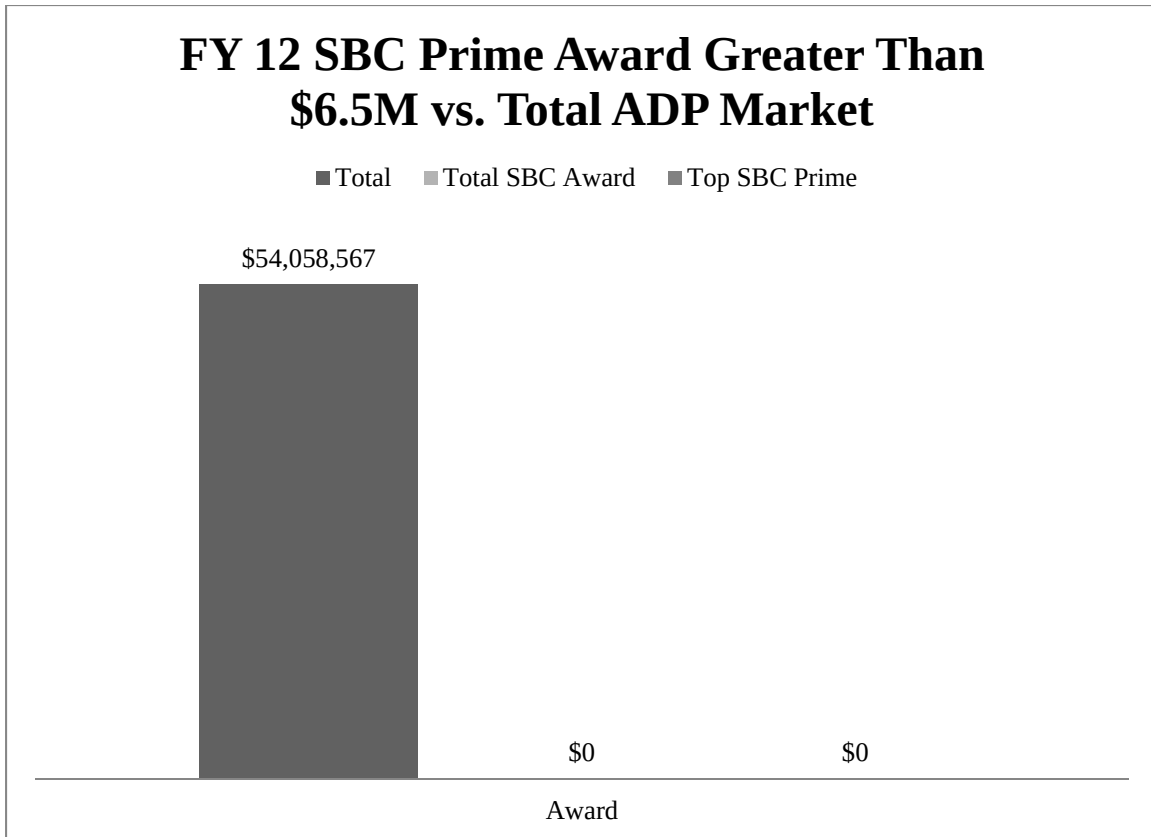


Figure 11. SBC Prime Award Greater Than \$6.5M vs. Total Award ADP Market

SBC primes account for \$0 of the total award for this category and this constitutes zero percent of the eligible monetary award went to SBCs. The data collected in this section produce results that suggest that the ADP market in excess of \$6.5M per contract is consistently awarded to a select few large primes.

2. Analysis

a. Risk Mitigation Barrier

There were no SBC awards in this category of the ADP market. The consistent award of contracts in this category of the ADP market to exclusively large primes is indicative of the DON's risk mitigation barrier. This category of the ADP Market is biased to only large primes, and as a result, the SBC is eliminated for competing in the category of the ADP market

H. DON CONTRACTS \$1–\$6.49M LARGE PRIME CONTRACTORS

1. Market Summary

The DON spent a total of \$35.3B on contracts for the DON market (all PSCs) where each individual contract ranged from \$1–\$6.49M (United States Government, 2013). Large prime contractors in the DON market accounted for a majority of the all the awards in this category. After reviewing the data it is noted that large primes accounted for \$26.5B of this award or seventy-five percent of the total award. Large primes were awarded 191,537 contracts ranging from \$1–\$6.49M in this category for FY12 (United States Government, 2013). Of the 191,573 contracts awarded by the DON to large primes in this category, 7,360 of the contracts were awarded to the top five large primes (United States Government, 2013). The top five large prime contractors were awarded four percent of the total number of awarded contracts by the DON in this category.

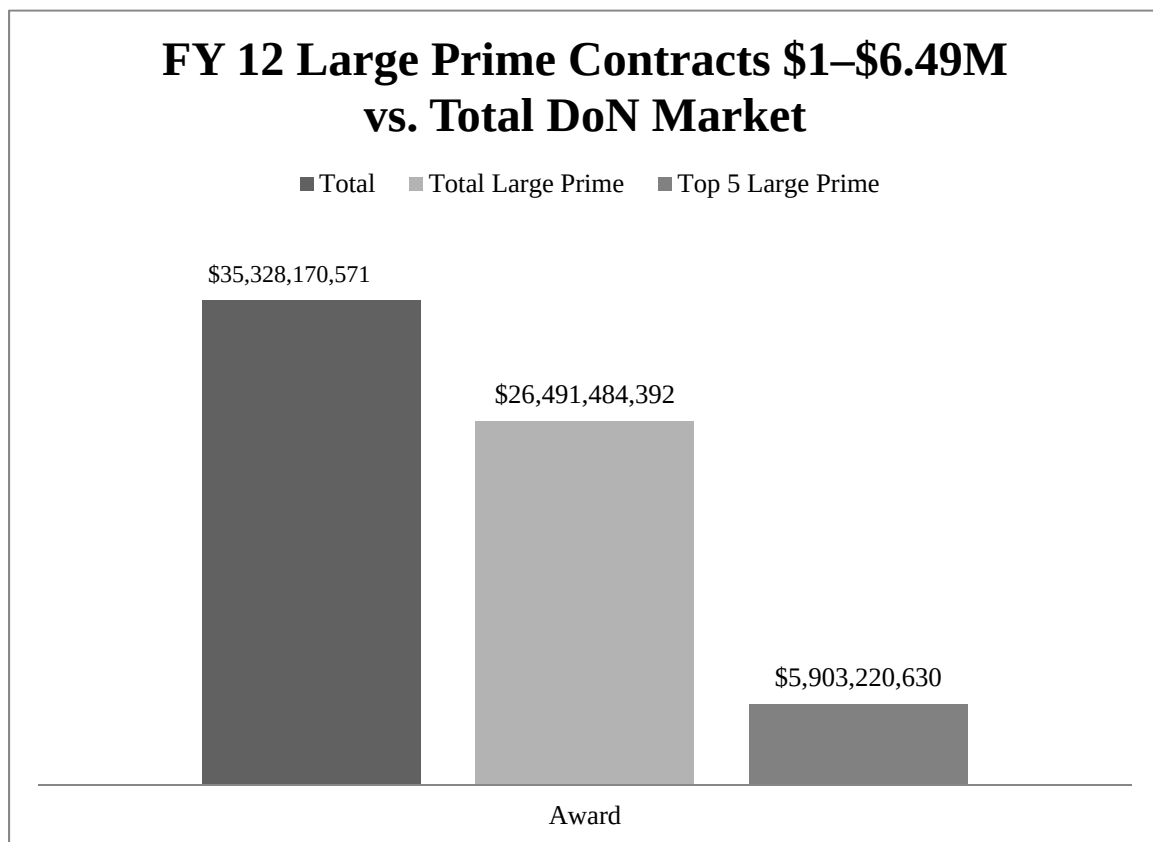


Figure 12. Large Prime Contracts \$1–6.49M vs. Total Award DON Market

The top five large primes account for \$5.9B of the total large prime award for this category and this constitutes nineteen percent of the eligible monetary award went to the top five companies. The data collected in this section produce results that suggest that the majority dollars spent by DON in this category is consistently awarded to large primes and a select few large primes are awarded the most lucrative contracts. Figure 13 represents the top five awardees as a percentage of the total DON award that went to large primes in this category.

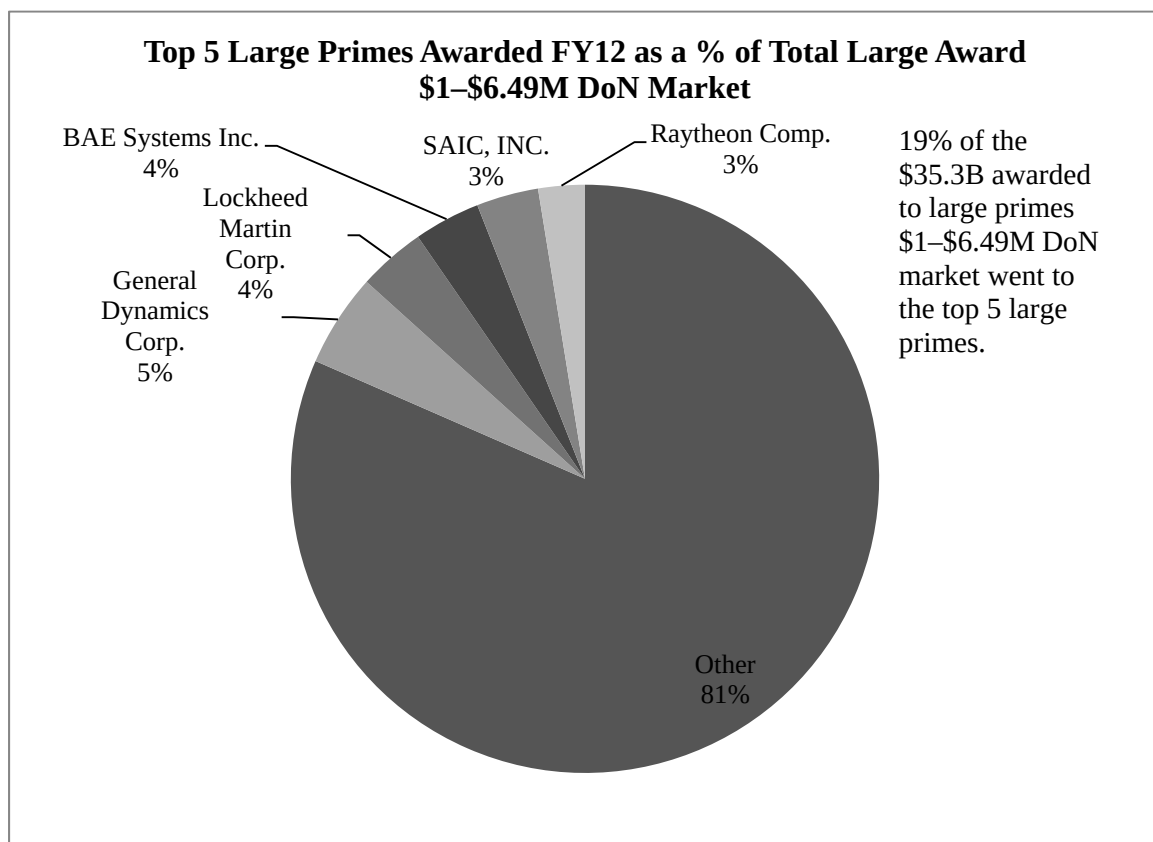


Figure 13. Top 5 Large Primes Awarded FY12 as a Percentage of Total Large Award \$1–\$6.49M DON Market

2. Profiles

The top five companies in this category along with the total dollar amount awarded to each company for FY12 are provided in Table 8. The following section is a

brief profile of each company considered to be a top performer for this specific category. The purpose of this section is to highlight certain data in order to establish typical behaviors and business characteristics that are shared by the top performers for this category.

Company	Amount Awarded
General Dynamics Corporation	\$1,641,893,578
Lockheed Martin Corporation	\$1,182,958,949
BAE Systems PLC	\$1,168,038,009
SAIC, INC.	\$1,092,938,072
Raytheon Company	\$817,392,022

Table 8. Top 5 Large Primes Awarded \$1–\$6.49M DON Market Amount Awarded

a. General Dynamics Corporation

The General Dynamics Corporation is classified as a provider of ship building, repair and aircraft (Hoover's Company Records - In-depth Records, 2013). The reported net sales of General Dynamics are \$32.7B for FY12 and General Dynamics has 95,100 employees (Global Duns Market Identifiers, 2012).

General Dynamics' total FY 12 Contracts for the DON market \$1–6.49M was 3,576 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, General Dynamics was awarded 8,961 contracts by the DoD (United States Government, 2013). General Dynamics' history with the DoD/DON dates back over a decade and the annual award total is consistently over a billion dollars (United States Government, 2013).

General Dynamics is a recurring DoD/DON contracting partner that possesses limited intellectual property. General Dynamics has submitted nine patents in the United States in the past 24 months (LexisNexis, 2013). General Dynamics and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

b. Lockheed Martin Corporation

The Lockheed Martin Corporation is classified as a provider of aircraft, aircraft parts and equipment (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Lockheed Martin are \$46.5B for FY12 and Lockheed has 123,000 employees (Global Duns Market Identifiers, 2012).

Lockheed's total FY 12 Contracts for the DON market \$1 - 6.49M was 2,017 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Lockheed was awarded 13,454 contracts by the DoD (United States Government, 2013). Lockheed's history with the DoD/DON dates back over a decade and the annual award total consistently has been in the billions of dollars (United States Government, 2013).

Lockheed is a recurring DoD/DON contracting partner that possesses a great deal of intellectual property. Lockheed has submitted 101 patents in the United States in the past 24 months (LexisNexis, 2013). Lockheed and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

c. BAE Systems PLC

BAE Systems PLC is classified as a provider of aircraft (Hoover's Company Records - In-depth Records, 2013). The reported net sales of BAE Systems PLC are \$17.8B for FY12 and BAE Systems PLC has 87,000 employees (Global Duns Market Identifiers, 2012).

BAE Systems PLC total FY 12 Contracts for the DON market \$1 - 6.49M was 2,649 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, BAE Systems PLC was awarded 2,649 contracts by the DoD (United States Government, 2013). BAE Systems PLC history with the DoD/DON dates back to 2004 and the annual award has ranged from \$8.4M in 2004 to \$4.1M in 2012 (United States Government, 2013).

BAE Systems PLC is a recurring DoD/DON contracting partner that possesses limited intellectual property. BAE Systems PLC has submitted nine patents in the United States in the past 24 months (LexisNexis, 2013). BAE Systems PLC and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

d. SAIC INC.

SAIC INC. is classified as a provider of computer integrated system design, computer programming services, pre-packaged software and computer related services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of SAIC are \$10.6B for FY12 and SAIC has 41,100 employees (Global Duns Market Identifiers, 2012).

SAIC's total FY 12 Contracts for the DON market \$1 - 6.49M was 2,383 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, SAIC was awarded 6,425 contracts by the DoD (United States Government, 2013). SAIC's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$281.6M in 2000 to \$3.4B in 2012 (United States Government, 2013).

SAIC is a recurring DoD/DON contracting partner that possesses limited intellectual property. SAIC has submitted three patents in the United States in the past 24 months (LexisNexis, 2013). SAIC and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

e. Raytheon Company

The Raytheon Company is classified as a provider of navigation, search equipment and communication equipment (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Raytheon are \$24.8B for FY12 and Raytheon has 71,000 employees (Global Duns Market Identifiers, 2012).

Raytheon's total FY 12 Contracts for the DON market \$1 - 6.49M was 1,265 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Raytheon was awarded 9,475 contracts by the DoD (United States Government, 2013). Raytheon's history with the DoD/DON dates back over a decade and the annual award has consistently been for billions of dollars (United States Government, 2013).

Raytheon is a recurring DoD/DON contracting partner that possesses a great deal of intellectual property. Raytheon has submitted 143 patents in the United States in the past 24 months (LexisNexis, 2013). Raytheon and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

3. Analysis

a. Design Disclosure Barrier

The large prime DON market where each individual contract was for \$1–6.49M greater, suggests that there is no design disclosure barrier experienced by the top five large primes in this category of the DON market. Each of the top five companies submitted multiple patents and have possessed various amounts of intellectual property the past two years. What must be understood by potential competitors in this category of the DON market is that in order to be viable, a top five large prime in this category must possess some intellectual property.

b. Risk Mitigation Barrier

Analysis of the risk mitigation barrier for this category of the DON market reveals a DoD/DON tendency to employ familiar top large primes. Four of the top five large primes profiled in this category have established relationships with the DoD/DON that have been occurring for a decade and in some cases occurring for decades. This ongoing relationship with eighty percent of the participants suggests that there is evidence of the DON attempting to mitigate risk by consistently awarding contracts to a limited number of recurring top large primes. However, this practice is offset by the data

that demonstrates that the DON awarded only four percent of the total number of awards and nineteen percent of the total dollar award to the top five large primes. Conversely, all other large primes were awarded ninety-six percent of the total number of awards and eighty-one percent of the total dollar award. The DON's risk-adverse practices are evident in this category but are lessened by an obviously competitive large prime award process.

c. Prime Practices Barrier

There is evidence in this category of prime practices that limit competition. The top four of five large primes in this category each experienced increasing award totals over the past decade. This behavior indicates that there is a propensity for large primes to consistently seek more contract awards and to be awarded at an increasing rate as the familiarity to DoD/DON business practices increases. Prime practice barriers in this category of the DON market allow the large prime to capitalize on recurring relationships and access to intellectual property through design disclosure.

I. DON CONTRACTS \$1.00-6.49M SBC PRIME CONTRACTS

1. Market Summary

The DON spent a total of \$35.3B on contracts for the DON market (all PSCs) where each individual contract ranged from \$1–6.49M (United States Government, 2013). Contracts ranging from \$1–6.49M awarded to SBC prime contractors in the DON market accounted for a notable percentage of the all the awards in this category. After reviewing the data it is noted that SBC primes accounted for \$8.8B of this award or twenty-five percent of the total award. SBC primes were awarded 58,215 contracts ranging \$1–6.49M in this category for FY12 (United States Government, 2013). Of the 58,215 contracts awarded by the DON to SBC primes in this category 1,854 of the contracts were awarded to the top five SBC primes (United States Government, 2013). The top five SBC prime contractors were awarded five percent of the total number of awarded contracts by the DON in this category.

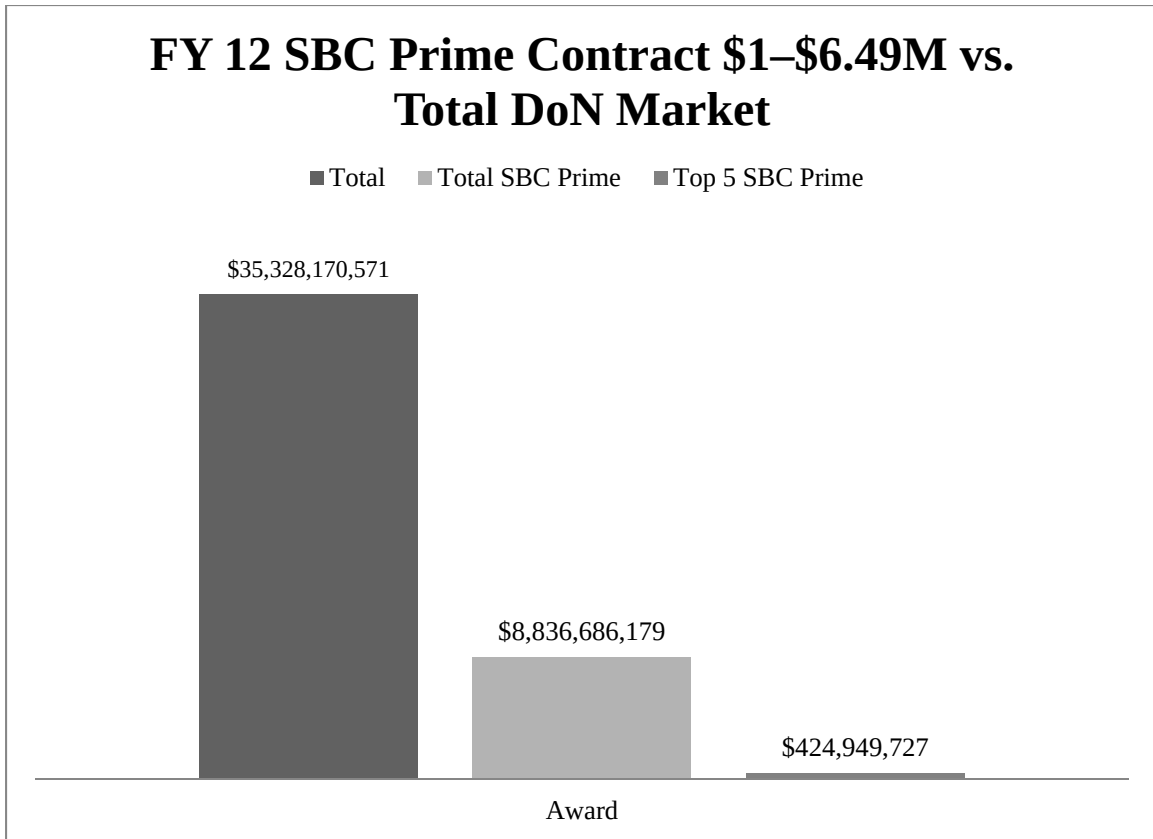


Figure 14. SBC Prime Contract \$1–6.49M vs. Total DON Market

The top five large primes account for \$425M of the total large prime award for this category and this constitutes five percent of the eligible monetary award went to the top five companies. The data collected in this section produce results that suggest that the \$1–6.49M DON market is diversely distributed among many different SBC primes. Figure 15 represents the top five awardees as a percentage of the total DON award that went to SBC primes in this category.

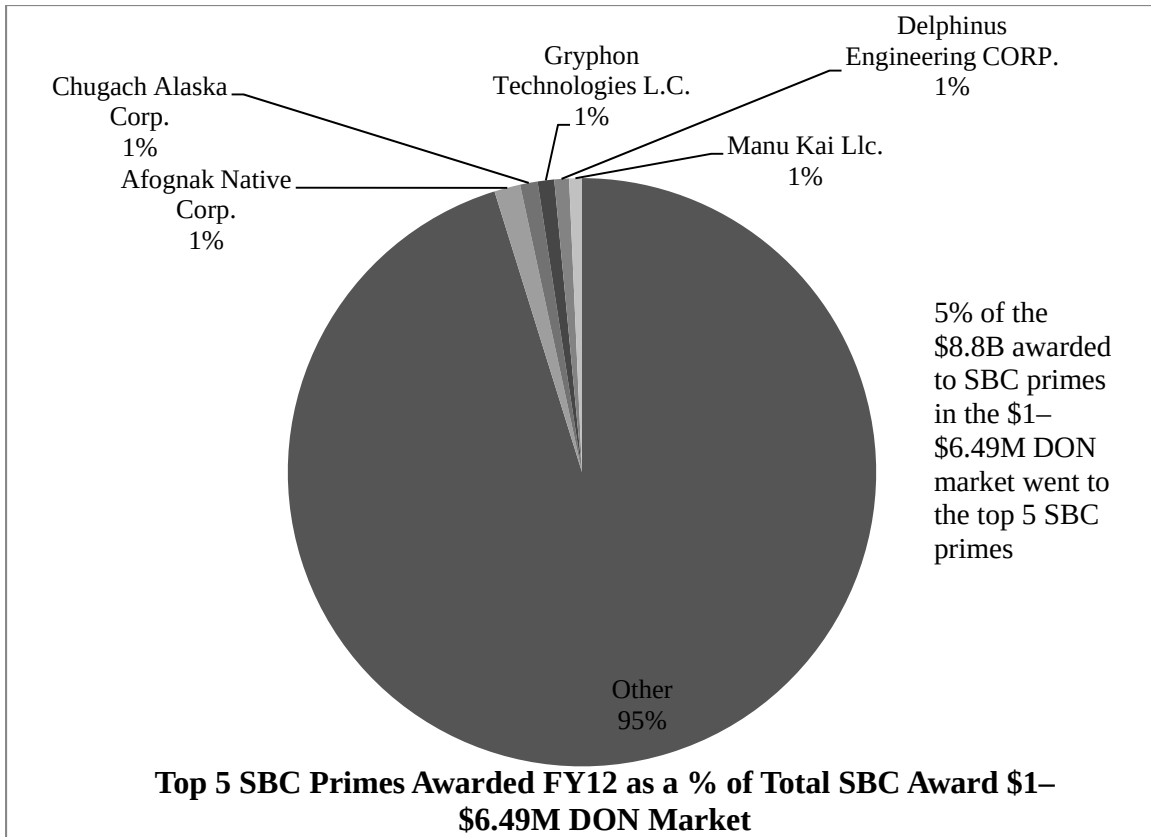


Figure 15. Top 5 SBC Primes Awarded FY12 as a Percentage of Total SBC Award \$1-\$6.49M DON Market

2. Profiles

The top five companies in this category along with the total dollar amount awarded to each company for FY12 are provided in Table 9. The following section is a brief profile of each company considered to be a top performer for this specific category. The purpose of this section is to highlight certain data in order to establish typical behaviors and business characteristics that are shared by the top performers for this category.

Company	Amount Awarded
Afognak Native Corporation	\$126,633,571
Chugach Alaska Corporation	\$84,548,256
Gryphon Technologies LC	\$80,303,158
Delphinus Engineering Corporation	\$71,137,568
Manu Kai LLC	\$62,327,174

Table 9. Top 5 SBC Primes Awarded \$1–\$6.49M DON Market Amount Awarded

a. Afognak Native Corporation

Afognak Native Corporation (ALUTHQ) is classified as a provider of forestry services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Afognak are \$1.8M for FY12 and Afognak has 4,450 employees (Global Duns Market Identifiers, 2012).

Afognak's total FY 12 Contracts for the \$1–\$6.49M DON market was 701 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Afognak was awarded 2,138 contracts by the DoD (United States Government, 2013). Afognak's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$844.8K in 2000 to \$319.8M in 2012 (United States Government, 2013).

Afognak's is a recurring DoD/DON contracting partner that possesses limited intellectual property. Afognak has submitted one patent in the United States in the past 24 months and nine patents total (LexisNexis, 2013). Afognak and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

b. Chugach Alaska Corporation

The Chugach Alaska Corporation is classified as a provider of facilities support services and computer integrated systems design (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Chugach Alaska are \$937M for FY12 and Chugach Alaska has 5,400 employees (Global Duns Market Identifiers, 2012).

Chugach Alaska's total FY 12 Contracts for the \$1–\$6.49M DON market was 490 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Chugach Alaska was awarded 1,395 contracts by the DoD (United States Government, 2013). Chugach Alaska's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$173.8M in 2000 to \$321M in 2012 (United States Government, 2013).

Chugach Alaska is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Chugach Alaska has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Chugach Alaska and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

c. Gryphon Technologies LC

Gryphon Technologies LC is classified as a provider of commercial physical research and computer programming services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Gryphon Technologies are \$87.8M for FY12 and Gryphon Technologies has 250 employees (Global Duns Market Identifiers, 2012).

Gryphon Technologies' total FY 12 Contracts for the \$1–\$6.49M DON market was 168 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Gryphon Technologies was awarded 201 contracts by the DoD (United States Government, 2013). Gryphon Technologies' history with the DoD/DON dates back over a decade and the annual award total has ranged from \$3.7M in 2000 to \$82.4M in 2012 (United States Government, 2013).

Gryphon Technologies is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Gryphon Technologies has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Gryphon Technologies and has consistently benefitted as evidenced by increasing

DoD/DON award totals each year from diversified and prolonged participation in DON markets.

d. Delphinus Engineering Corporation

The Delphinus Engineering Corporation is classified as a provider of engineering services and repair services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Delphinus Engineering are \$33M for FY12 and Delphinus Engineering has 370 employees (Global Duns Market Identifiers, 2012).

Delphinus Engineering's total FY 12 Contracts for the DON market \$1–\$6.49M was 319 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Delphinus Engineering was awarded 319 contracts by the DoD (United States Government, 2013). Delphinus Engineering's history with the DoD/DON dates back to 2005 and the annual award total has ranged from \$510.5K in 2005 to \$11.6M in 2012 (United States Government, 2013).

Delphinus Engineering is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Delphinus has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Delphinus Engineering and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

e. Manu Kai LLC

Manu Kai LLC is classified as a provider of computer facilities management (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Manu Kai are \$5.1M for FY12 and Manu Kai has 99 employees (Global Duns Market Identifiers, 2012).

Manu Kai's total FY 12 Contracts for the DON market \$1–\$6.49M was 176 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Manu Kai was awarded 258 contracts by the DoD (United States Government, 2013). Manu Kai's history with the DoD/DON

dates back to 2009 and annual award total has ranged from \$52.1M in 2009 to \$65.5M in 2012 (United States Government, 2013).

Manu Kai is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Manu Kai has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Manu Kai and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in DON markets.

3. Analysis

a. Design Disclosure Barrier

The top five in the SBC prime DON market where each individual contract was for \$1–\$6.49M collectively possesses very little intellectual property. Only one of five companies, Afognak Native Corporation has submitted one patent in the past two years and a total of nine patents overall. The majority of the top SBC participants in this category of the DON market do not possess intellectual property. When compared to the large primes in a similar category of the DON market, where one hundred percent of the top five possessed intellectual property the absence of intellectual property for the SBC primes suggests that there is a design disclosure barrier associated with SBC participation in this category of the DON market.

b. Risk Mitigation Barrier

Three of the five SBCs primes profiled in this category have established relationships with the DoD/DON that have been occurring for a decade and in some cases occurring for decades. Evidence that forty percent of the top SBCs in this category of the DON market have yet to establish relationships of a decade or more indicate that the risk mitigation barrier in this category of the DON market is limited when applied to SBC participation. The recurring SBCs in this category were only awarded five percent of the number of awards and five percent of the total dollar award. Conversely, all other SBC primes were awarded ninety-five percent of the total number of awards and ninety-five

percent of the total dollar award. This category of the DON market is an obvious example of a competitive award process.

c. Prime Practices Barrier

Although minimal there is evidence in this category of prime practices that may limit competition. The top five SBC primes in this category each experienced increasing award totals over the past decade. This behavior indicates that there is a propensity for SBC primes to consistently seek more contract awards and to be awarded at an increasing rate as the familiarity to DoD/DON business practices increases. This behavior indicates that the top SBC prime is able to capitalize on limited competition, through typical prime practices.

J. NOA CONTRACTS \$1.00-6.49M LARGE PRIME CONTRACTORS

1. Market Summary

The DON spent a total of \$2.46B on contracts for the NOA market (PSCs 70 & D) where each individual contract was for \$1–\$6.49M (United States Government, 2013). Contracts ranging from \$1–\$6.49M awarded to large prime contractors in the NOA market accounted for a majority of the all the awards in this category. After reviewing the data it is noted that large primes accounted for \$1.82B of this award or seventy-four percent of the total award. Large primes were awarded 16,746 contracts ranging from \$1–\$6.49M in the NOA market for FY12 (United States Government, 2013). Of the 16,746 contracts awarded by the DON to large primes in this category, 1,007 of the contracts were awarded to the top five large primes (United States Government, 2013). The top five large prime contractors were awarded sixty-eight percent of the total number of awarded contracts by the DON in this category.

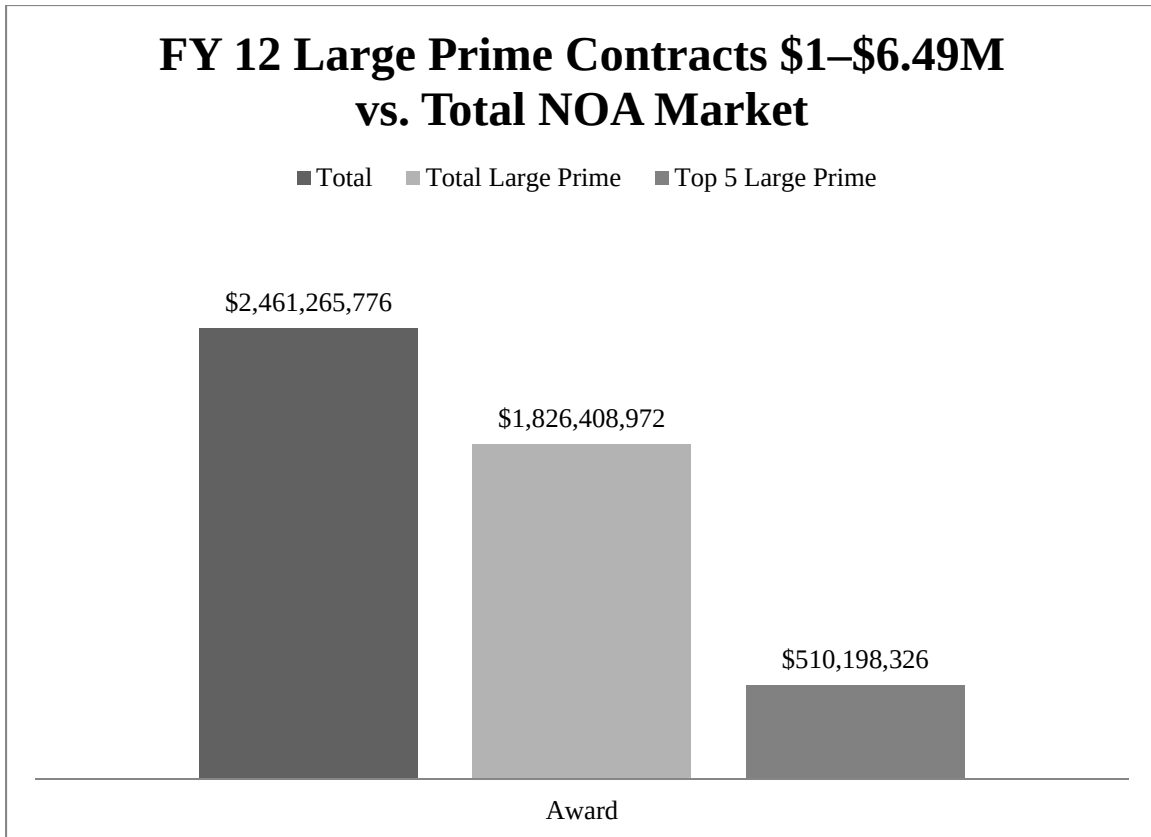


Figure 16. Large Prime Contracts \$1–\$6.49M vs. Total Award NOA Market

The top five large primes account for \$510M of the total large prime award for this category and this constitutes twenty-eight percent of the eligible monetary award went to the top five companies. The data collected in this section produce results that suggest that the majority of the DON market is consistently awarded to a select few large primes. Figure 17 represents the top five awardees as a percentage of the total NOA award that went to large primes in this category.

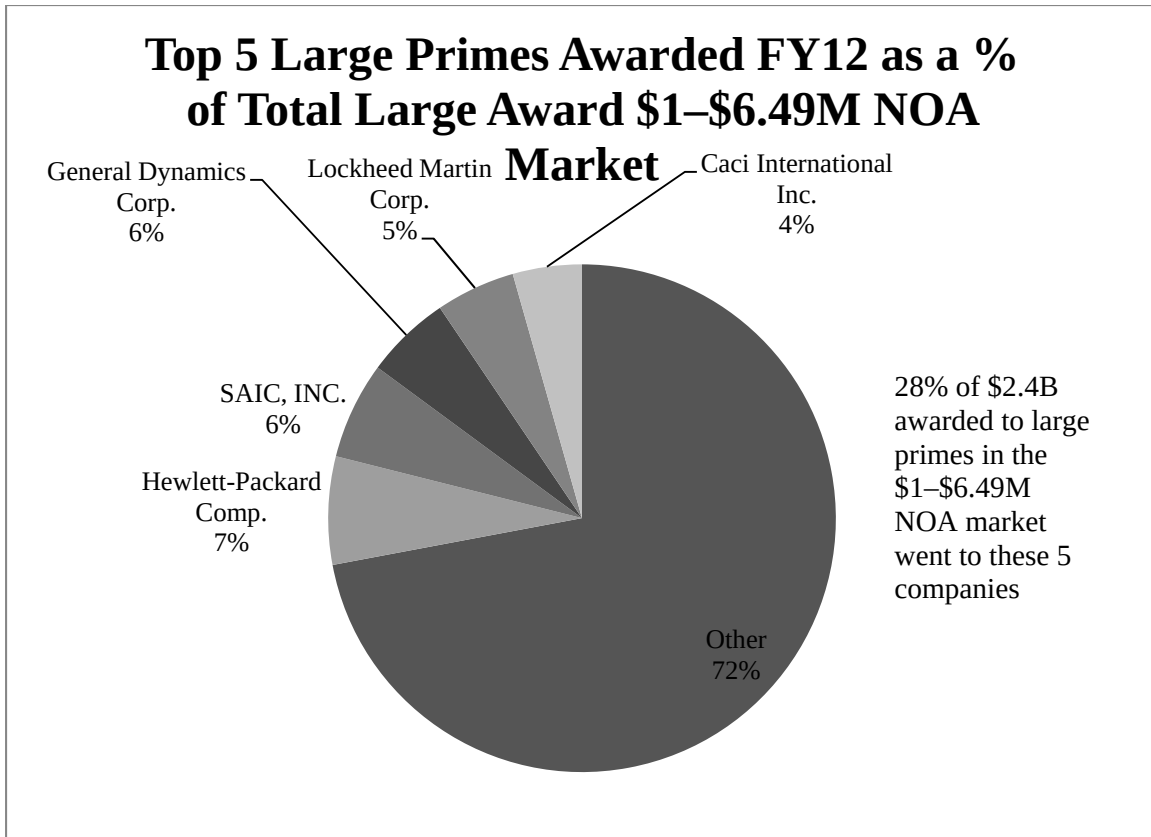


Figure 17. Top 5 Large Primes Awarded FY12 as a Percentage of Total Large Award \$1–6.49M NOA Market

2. Profiles

The top five companies in this category along with the total dollar amount awarded to each company for FY12 are provided in Table 10. The following section is a brief profile of each company considered to be a top performer for this specific category. The purpose of this section is to highlight certain data in order to establish typical behaviors and business characteristics that are shared by the top performers for this category.

Company	Amount Awarded
Hewlett-Packard Company	\$125,737,095
SAIC, INC.	\$112,900,352
General Dynamics Corporation	\$99,177,511
Lockheed Martin Corporation	\$92,316,228
Caci International INC.	\$80,431,140

Table 10. Top 5 Large Primes Awarded \$1–\$6.49M NOA Market Amount Awarded

a. *Hewlett-Packard Company*

The Hewlett-Packard Company is classified as a provider of electronic computers, computer storage devices, computer peripheral equipment, investment advice, computer programming services, pre-packaged software, computer integrated systems design, data processing and preparation and computer related services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Hewlett-Packard are \$120.3B for FY12 and Hewlett-Packard has 324,600 employees (Global Duns Market Identifiers, 2012).

Hewlett-Packard's total FY 12 Contracts for the NOA market \$1–\$6.49M was 319 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Hewlett-Packard was awarded 2,379 contracts by the DoD (United States Government, 2013). Hewlett-Packard's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$14.7M in 2000 to \$138.3M in 2012 (United States Government, 2013).

Hewlett-Packard is a recurring DoD/DON contracting partner that possesses a great deal of intellectual property. Hewlett-Packard has submitted 288 patents in the United States in the past 24 months (LexisNexis, 2013). Hewlett-Packard and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

b. SAIC INC.

SAIC INC. is classified as a provider of computer integrated system design, computer programming services, pre-packaged software and computer related services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of SAIC are \$10.6B for FY12 and SAIC has 41,100 employees (Global Duns Market Identifiers, 2012).

SAIC's total FY 12 Contracts for the NOA market \$1–\$6.49M was 141 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, SAIC was awarded 6,425 contracts by the DoD (United States Government, 2013). SAIC's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$281.6M in 2000 to \$3.4B in 2012 (United States Government, 2013).

SAIC is a recurring DoD/DON contracting partner that possesses limited intellectual property. SAIC has submitted three patents in the United States in the past 24 months (LexisNexis, 2013). SAIC and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

c. General Dynamics Corporation

The General Dynamics Corporation is classified as a provider of ship building, repair and aircraft (Hoover's Company Records - In-depth Records, 2013). The reported net sales of General Dynamics are \$32.7B for FY12 and General Dynamics has 95,100 employees (Global Duns Market Identifiers, 2012).

General Dynamics' total FY 12 Contracts for the NOA market \$1–\$6.49M was 204 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, General Dynamics was awarded 8,961 contracts by the DoD (United States Government, 2013). General Dynamics' history with the DoD/DON dates back over a decade and the annual award total is consistently over a billion dollars (United States Government, 2013).

General Dynamics is a recurring DoD/DON contracting partner that possesses limited intellectual property. General Dynamics has submitted nine patents in the United States in the past 24 months (LexisNexis, 2013). General Dynamics and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

d. Lockheed Martin Corporation

The Lockheed Martin Corporation is classified as a provider of aircraft, aircraft parts and equipment (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Lockheed Martin are \$46.5B for FY12 and Lockheed has 123,000 employees (Global Duns Market Identifiers, 2012).

Lockheed's total FY 12 Contracts for the NOA market \$1–\$6.49M was 221 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Lockheed was awarded 13,454 contracts by the DoD (United States Government, 2013). Lockheed's history with the DoD/DON dates back over a decade and the annual award total consistently has been in the billions of dollars (United States Government, 2013).

Lockheed is a recurring DoD/DON contracting partner that possesses a great deal of intellectual property. Lockheed has submitted 101 patents in the United States in the past 24 months (LexisNexis, 2013). Lockheed and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

e. Caci International INC.

Caci International INC. is classified as a provider of computer integrated system design, computer programming services, pre-packaged software and computer facilities management (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Caci International are \$3.77B for FY12 and Caci International has 14,500 employees (United States Government, 2013).

Caci International's total FY 12 Contracts for the NOA market \$1–\$6.49M was 122 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Caci International was awarded 3,096 contracts by the DoD (United States Government, 2013). Caci International's history with the DoD/DON dates back more than a decade and the annual award total has ranged from \$43.3M in 2000 to \$555.3M in 2012 (United States Government, 2013).

Caci International is a recurring DoD/DON contracting partner that possesses very limited intellectual property. Caci International has not submitted any patents in the United States in the past 24 months and two patents total (LexisNexis, 2013). Caci International and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

3. Analysis

a. Design Disclosure Barrier

Analysis of the large prime NOA market where each individual contract was for \$1–6.49M greater suggests that there is a link between the number of patents submitted in the past two years and the cumulative dollar amount of contracts awarded to each company in this category of the NOA market. Four of the five top large primes in this category of the NOA market possess intellectual property and have submitted patents in the past two years. The only large prime that has not submitted patents in the past two years was Caci International INC., who ranked five of five in the cumulative dollar amount awarded to the top five large primes. The top awardee, Hewlett-Packard led all with 288 patents submitted.

When it is considered that eighty percent of the large primes awarded in this category are companies that have submitted patents in the US the past two years; there is no evidence to suggest that large primes are negatively impacted by design disclosure barriers that require disclosure of intellectual property to the DON.

b. Risk Mitigation Barrier

Each of the five large primes profiled in this category have established relationships with the DoD/DON that have been occurring for a decade and in some cases occurring for decades. This ongoing relationship suggests that there is evidence of the DON being risk adverse and consistently awarding contracts to a limited number of recurring large primes. The DON awarded sixty-eight percent of the total number of awards and twenty-eight percent of the total dollar award to the top five large primes. Conversely, all other large primes were awarded thirty-two percent of the total number of awards and seventy-two percent of the total dollar award. The DON's risk adverse practices that lead to competition barriers are evident in the significant number of contracts awarded to a recurring top five large prime.

c. Prime Practices Barrier

There is evidence in this category of prime practices that prevent competition. The top five large primes in this category each experienced increasing award totals over the past decade. This behavior indicates that there is a propensity for large primes to consistently seek more contract awards and to be awarded at an increasing rate as the familiarity to DoD/DON business practices increases. This behavior is also influenced the risk mitigation barrier, as large primes are deemed less risk adverse to the DoD/DON there appears to be a link to increased awards. Through prime practice barriers the large prime is able to capitalize on limited competition opportunities.

K. NOA CONTRACTS \$1–6.49M SBC PRIME CONTRACTORS

1. Market Summary

The DON spent a total of \$2.46B on contracts for the NOA market (PSCs 70 & D) where each individual contract was for \$1–\$6.49M (United States Government, 2013). Contracts ranging from \$1–6.49M awarded to SBC Prime Contractors in the NOA market account for a significant portion of the all the awards in this category. After reviewing the data it is noted that SBC Primes accounted for \$635M of this award or twenty-six percent of the total award. SBC Primes were awarded 5,277 contracts ranging

from \$1–\$6.49M in the NOA market for FY12 (United States Government, 2013). Of the 5,277 contracts awarded by the DON to SBC primes in this category 351 of the contracts were awarded to the top five SBC primes (United States Government, 2013). The top five SBC prime contractors were awarded seven percent of the total number of awarded contracts by the DON in this category.

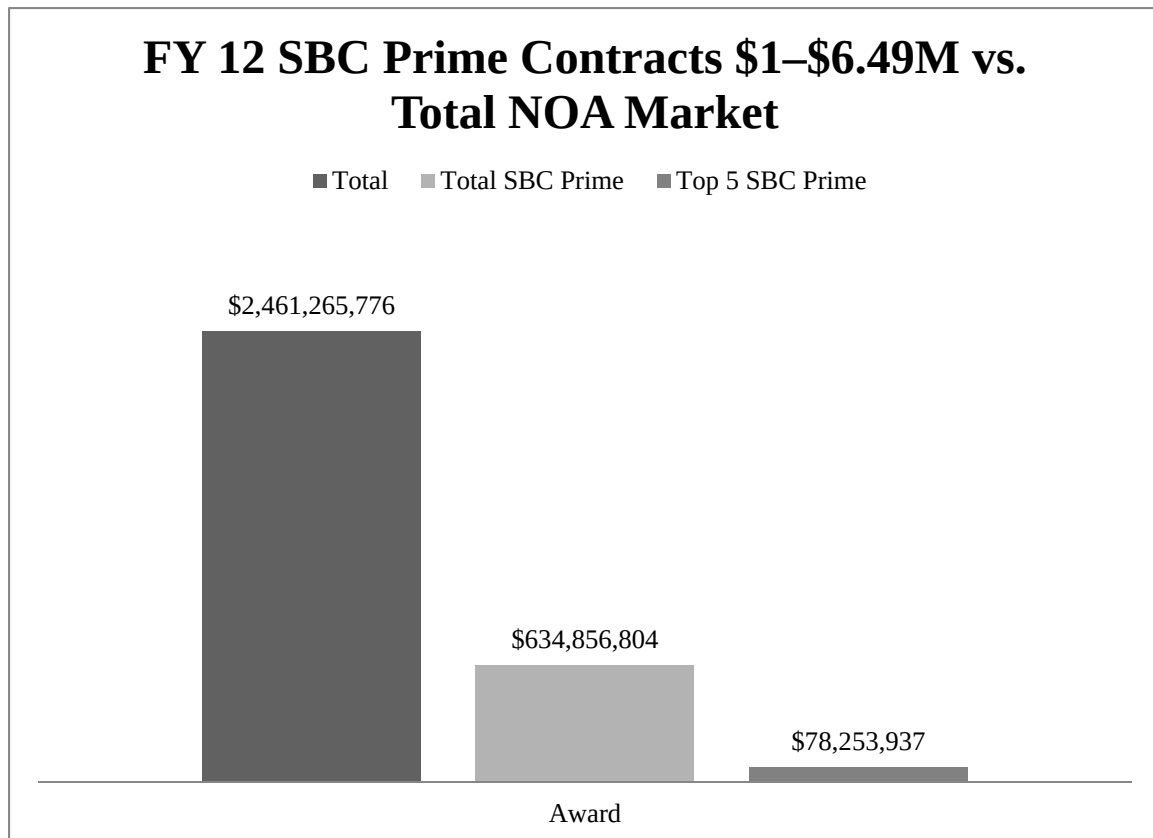


Figure 18. SBC Prime Contracts \$1–\$6.49M vs. Total NOA Market

The top five SBC primes account for \$78.3M of the total SBC prime award for this category and this constitutes twelve percent of the eligible monetary award went to the top five companies. The data collected in this section produce results that suggest that the NOA SBC market is substantial and diverse. Figure 19 represents the top five awardees as a percentage of the total DON award that went to SBC primes in this category.

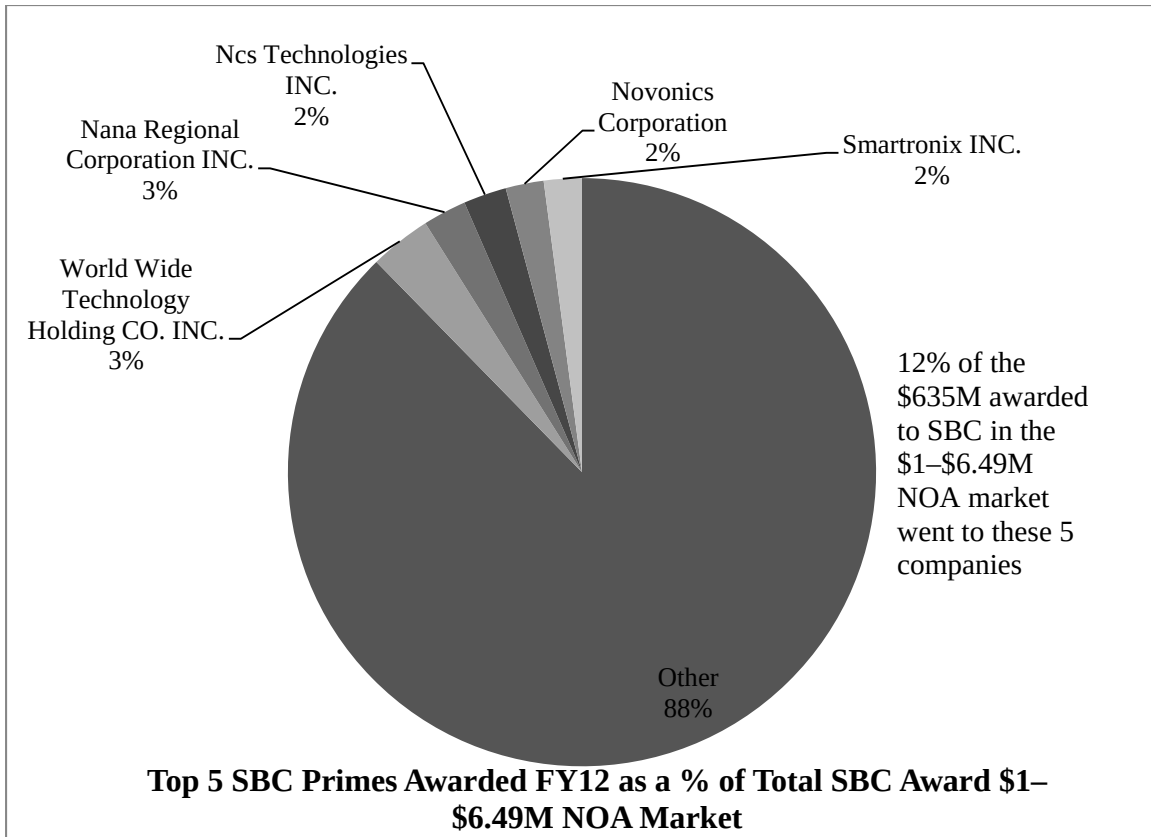


Figure 19. Top 5 SBC Primes Awarded FY12 as a Percentage of Total SBC Award \$1-\$6.49M NOA Market

2. Profiles

The top five companies in this category along with the total dollar amount awarded to each company for FY12 are provided in Table 11. The following section is a brief profile of each company considered to be a top performer for this specific category. The purpose of this section is to highlight certain data in order to establish typical behaviors and business characteristics that are shared by the top performers for this category.

Company	Amount Awarded
World Wide Technology Holding CO. INC.	\$21,502,934
Nana Regional Corporation INC.	\$15,188,645
NCS Technologies	\$15,052,805
Novonics Corporation	\$13,263,678
Smartronix INC.	\$13,245,875

Table 11. Top 5 SBC Primes Awarded \$1–\$6.49M NOA Market Amount Awarded

a. World Wide Technology Holding CO. INC.

World Wide Technology Holding CO. INC. is classified as a provider of computer peripherals, software and business consulting (Hoover's Company Records - In-depth Records, 2013). The reported net sales of World Wide Technology are \$4B for FY12 and World Wide Technology has 1,008 employees (Global Duns Market Identifiers, 2012).

World Wide Technology's total FY 12 Contracts for the NOA market \$1–\$6.49M was 158 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, World Wide Technology was awarded 1,845 contracts by the DoD (United States Government, 2013). World Wide's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$27.6M in 2000 to \$239.6M in 2012 (United States Government, 2013).

World Wide Technology is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. World Wide Technology has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). World Wide Technology and has consistently benefited as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

b. Nana Regional Corporation INC.

Nana Regional Corporation, INC. is classified as a provider of navigation, oil and gas field services, electrical services and combination utilities (Hoover's

Company Records - In-depth Records, 2013). The reported net sales of Nana Regional are \$1.6B for FY12 and Nana Regional has 9,000 employees (Global Duns Market Identifiers, 2012).

Nana Regional's total FY 12 Contracts for the NOA market \$1–\$6.49M was 68 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Nana Regional was awarded 81 contracts by the DoD (United States Government, 2013). Nana Regional's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$1M in 2000 to \$7.6M in 2012 (United States Government, 2013).

Nana Regional is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Nana Regional has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Nana Regional and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

c. NCS Technologies INC.

NCS Technologies INC. is classified as a provider of computer and software stores (Hoover's Company Records - In-depth Records, 2013). The reported net sales of NCS Technologies are \$420K for FY12 and NCS Technologies has 6 employees (Global Duns Market Identifiers, 2012).

NCS Technologies' total FY 12 Contracts for the NOA market \$1–\$6.49M was 69 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, NCS Technologies was awarded 492 contracts by the DoD (United States Government, 2013). NCS Technologies history with the DoD/DON dates back over a decade and the annual award total has ranged from \$2.8M in 2000 to \$48.9M in 2012 (United States Government, 2013).

NCS Technologies is a recurring DoD/DON contracting partner that possesses minimal intellectual property. NCS Technologies has not submitted any

patents in the United States in the past 24 months and one patent total (LexisNexis, 2013). NCS Technologies and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

d. Novonics Corporation

The Novonics Corporation is classified as a provider of management consulting services and computer related services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Novonics Corporation are \$10.8M for FY12 and Novonics has 120 employees (United States Government, 2013).

Novonics' total FY 12 Contracts for the NOA market \$1–\$6.49M was 47 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Novonics was awarded 94 contracts by the DoD (United States Government, 2013). Novonics' history with the DoD/DON dates back over a decade and the annual award total has ranged from \$585.9K in 2001 to \$26.1M in 2012 (United States Government, 2013).

Novonics is a recurring DoD/DON contracting partner that possesses minimal intellectual property. Novonics has not submitted any patents in the United States in the past 24 months and one total patent (LexisNexis, 2013). Novonics and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

e. Smartronix INC.

Smartronix INC. is classified as a provider of computer programming services and computer integrated systems design (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Smartronix INC. are \$30.6M for FY12 and Smartronix has 500 employees (Global Duns Market Identifiers, 2012).

Smartronix's total FY 12 Contracts for the NOA market \$1–\$6.49M was nine awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Smartronix was awarded 55 contracts

by the DoD (United States Government, 2013). Smartronix's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$15.4M in 2000 to \$35.5M in 2012 (United States Government, 2013).

Smartronix is a recurring DoD/DON contracting partner that possesses minimal intellectual property. Smartronix has not submitted any patents in the United States in the past 24 months and two patents total (LexisNexis, 2013). Smartronix and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in NOA markets.

3. Analysis

a. Design Disclosure Barrier

The SBC prime NOA market where each individual contract was for \$1–\$6.49M suggests that there is a design disclosure barrier that prevents companies that possess intellectual property from participation in this category of the NOA market. Unlike the large primes in this category of the NOA market the SBCs that participate have no reliance on intellectual property. The absence of patents submitted by the SBC in this category is evidence that design disclosure barriers exist and limit competition. The stark contrast from the large prime eighty percent patent submission in this category vs. the zero percent SBC submission in this category supports the claim that would be SBC participants that possess intellectual property prefer to not participate in this category of NOA markets.

b. Risk Mitigation Barrier

Four of the five SBCs primes profiled in this category have established relationships with the DoD/DON that have been occurring for a decade and in some cases occurring for decades. Despite evidence that a risk mitigation barrier exists it is easily mitigated by the level of SBC competition in this category of the NOA market. The recurring SBCs in this category were only awarded seven percent of the number of awards and twelve percent of the total dollar award. Conversely, all other SBC primes were awarded ninety-three percent of the total number of awards and eighty-eight percent

of the total dollar award. This category of the NOA market is an obvious example of a competitive award process.

c. Prime Practices Barrier

There is evidence in this category of prime practices that could limit competition. The top five SBC primes in this category each experienced increasing award totals over the past decade. This behavior indicates that there is a propensity for SBC primes to consistently seek more contract awards and to be awarded at an increasing rate as the familiarity to DoD/DON business practices increases. However, as with the risk mitigation barrier the diversity in the total awards and amount limit the leverage created by the prime practice barrier in this category of the NOA market. SBCs in this category of the NOA market have a far greater opportunity to displace top SBC primes that have benefited from an increasing annual award due to typical prime practices.

L. ADP CONTRACTS \$1–6.49M LARGE PRIME CONTRACTORS

1. Market Summary

The DON spent a total of \$405M on contracts for the ADP market (PSC 7030) where each individual contract was for \$1–\$6.49M (United States Government, 2013). Contracts ranging from \$1–\$6.49M awarded to large prime contractors in the ADP market accounted for a majority of the all the awards in this category. After reviewing the data it is noted that large primes accounted for \$349M of this award or eighty-six percent of the total award. Large primes were awarded 4,477 contracts ranging from \$1–\$6.49M in the ADP market for FY12 (United States Government, 2013). Of the 4,477 contracts awarded by the DON to large primes in this category 992 of the contracts were awarded to the top five large primes (United States Government, 2013). The top five large prime contractors were awarded twenty-two percent of the total number of awarded contracts by the DON in this category.

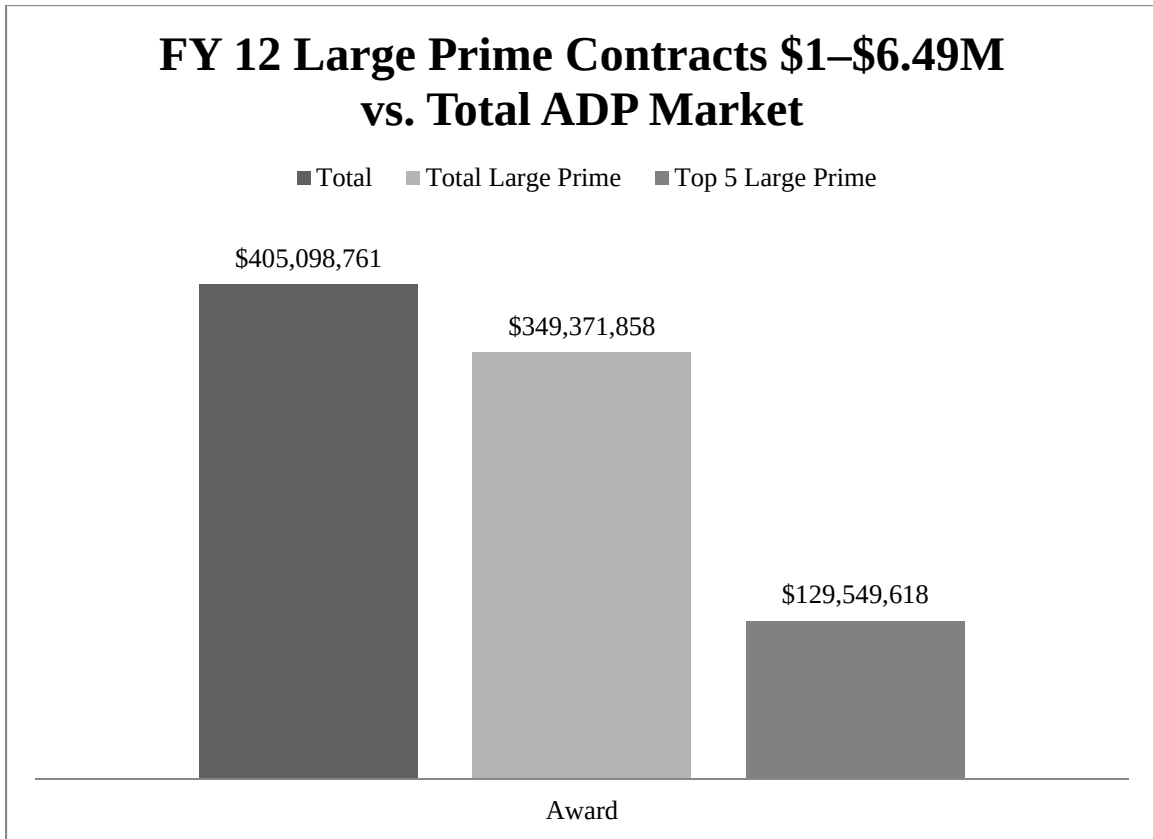


Figure 20. Large Prime Contracts \$1–\$6.49M vs. Total ADP Market

The top five large primes account for \$129.5M of the total large prime award for this category and this constitutes thirty-seven percent of the eligible monetary award went to the top five companies. The data collected in this section produce results that suggest that the majority of the DON market is consistently awarded to a select few large primes. Figure 21 represents the top five awardees as a percentage of the total DON award that went to large primes in this category.

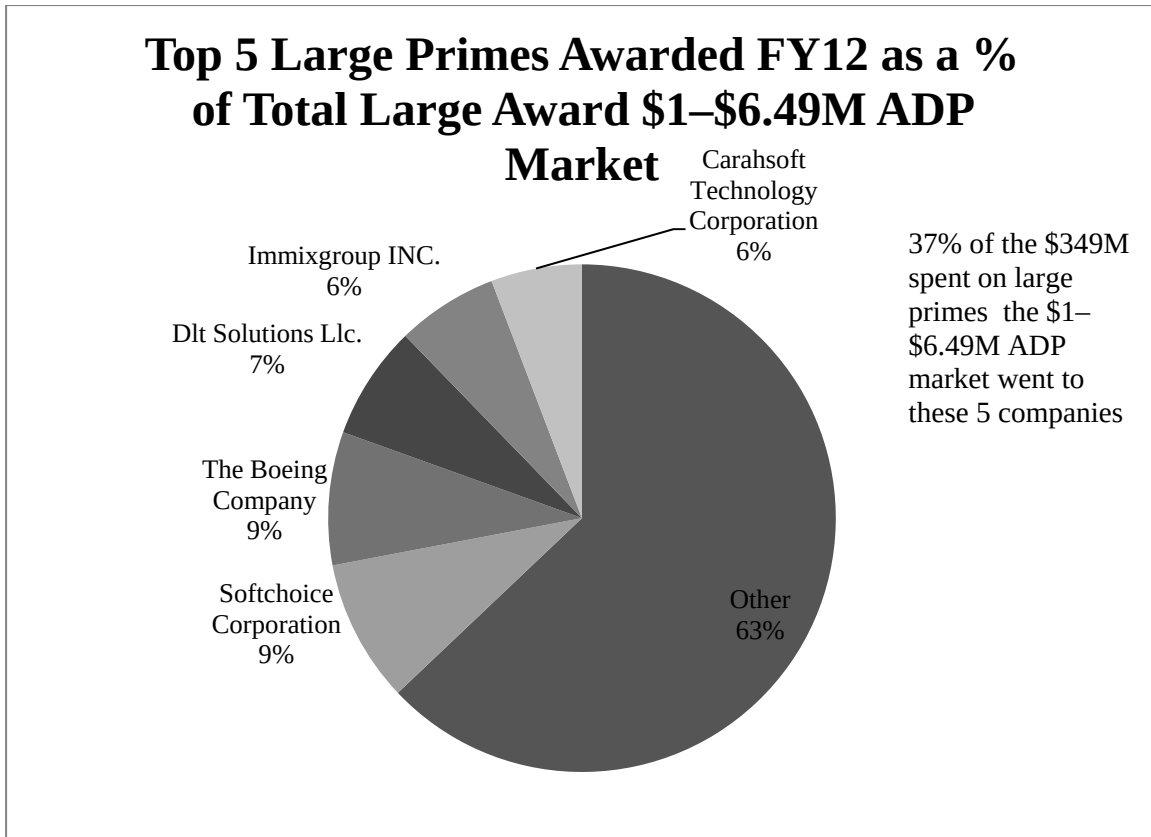


Figure 21. Top 5 Large Primes Awarded FY12 as a Percentage of Total Large Award \$1–\$6.49M ADP Market

2. Profiles

The top five companies in this category along with the total dollar amount awarded to each company for FY12 are provided in Table 12. The following section is a brief profile of each company considered to be a top performer for this specific category. The purpose of this section is to highlight certain data in order to establish typical behaviors and business characteristics that are shared by the top performers for this category.

Company	Amount Awarded
Softchoice Corporation	\$31,780,614
The Boeing Company	\$29,631,420
Dlt Solutions LLC	\$25,346,845
Immixgroup INC.	\$22,561,356
Carahsoft Technology Corporation	\$20,229,383

Table 12. Top 5 Large Prime Awarded \$1–\$6.49M ADP Market Amount Awarded

a. *Softchoice Corporation*

The Softchoice Corporation is classified as a provider of computer peripherals, software and computer integrated systems design (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Softchoice are \$999.4M for FY12 and Softchoice has 1,112 employees (Global Duns Market Identifiers, 2012).

Softchoice's total FY 12 Contracts for the ADP market \$1–\$6.49M was 211 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Softchoice was awarded 356 contracts by the DoD (United States Government, 2013). Softchoice's history with the DoD/DON dates back a decade and the annual award total has ranged from \$544K in 2002 to \$71.1M in 2012 (United States Government, 2013).

Softchoice is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Softchoice has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Softchoice and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

b. *The Boeing Company*

The Boeing Company is classified as a provider of aircraft, navigation and search equipment (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Boeing are \$68.7B for FY12 and Boeing has 171,700 employees (Global Duns Market Identifiers, 2012).

Boeing's total FY 12 Contracts for the ADP market \$1–\$6.49M was 36 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Boeing was awarded 10,350 contracts by the DoD (United States Government, 2013). Boeing's history with the DoD/DON dates back over a decade and the annual award total has been in the billions of dollars (United States Government, 2013).

Boeing is a recurring DoD/DON contracting partner that possesses a great deal of intellectual property. Boeing has submitted 271 patents in the United States in the past 24 months (LexisNexis, 2013). Boeing and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

c. DLT Solutions LLC

DLT Solutions is classified as a provider of computer programming services and computer integrated system design (Hoover's Company Records - In-depth Records, 2013). The reported net sales of DLT Solutions are \$150K for FY12 and DLT Solutions has 250 employees (Global Duns Market Identifiers, 2012).

DLT's total FY 12 Contracts for the ADP market \$1–\$6.49M was 197 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, DLT was awarded 1,134 contracts by the DoD (United States Government, 2013). DLT's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$12.4M in 2000 to \$132M in 2012 (United States Government, 2013).

DLT is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. DLT has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). DLT and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

d. Immixgroup INC.

Immixgroup, INC. is classified as a provider of computers, peripherals and software (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Immixgroup are \$563.5M for FY12 and Immixgroup has 149 employees (Global Duns Market Identifiers, 2012).

Immixgroup's total FY 12 Contracts for the ADP market \$1–\$6.49M was 263 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Immixgroup was awarded 319 contracts by the DoD (United States Government, 2013). Immixgroup's history with the DoD/DON dates back to 2006 and the annual award total has ranged from \$239.2K in 2006 to \$15.8M in 2012 (United States Government, 2013).

Immixgroup is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Immixgroup has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Immixgroup and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

e. Carahsoft Technology Corporation

Carahsoft Technology Corporation is classified as a provider of computer and software stores (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Carahsoft are \$585.7M for FY12 and Carahsoft Technology has 150 employees (Global Duns Market Identifiers, 2012).

Carahsoft's total FY 12 Contracts for the ADP market \$1–\$6.49M was 285 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Carahsoft was awarded 12 contracts by the DoD (United States Government, 2013). Carahsoft's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$36.3K in 2000 to \$405.3K in 2012 (United States Government, 2013).

Carahsoft is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Carahsoft has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Carahsoft and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

3. Analysis

a. Design Disclosure Barrier

Analysis of the large prime ADP market where each individual contract was for \$1–\$6.49M suggests that there is a design disclosure barrier that prevents potential ADP companies from participating for contracts in this category of the ADP market. Only one of five of the top large primes in this category of the ADP market has submitted patents in the past two years. This behavior indicates that the top participants in this category of the ADP market have no intellectual capital to risk upon award of a contract. Based on this analysis there is evidence to suggest data design disclosure barriers decrease competition in this category of the ADP market.

b. Risk Mitigation Barrier

Four of the five large primes profiled in this category have established relationships with the DoD/DON that have been occurring for a decade and in some cases occurring for decades. This ongoing relationship suggests that there is evidence of the DON being risk adverse and consistently awarding contracts to a limited number of recurring large primes. The DON awarded twenty-two percent of the total number of awards and thirty-seven percent of the total dollar award to the top five large primes. Conversely, all other large primes were awarded seventy-eight percent of the total number of awards and sixty-three percent of the total dollar award. The DON's risk adverse practices are evident not only the recurrence in the use of the same prime contractors for over a decade but these practices are also made evident through the significant reliance on only a few large primes for this category.

c. *Prime Practices Barrier*

There is evidence in this category of prime practices that limit competition. The top five large primes in this category each experienced increasing award totals over the past decade. This behavior indicates that there is a propensity for large primes to consistently seek more contract awards and to be awarded at an increasing rate as the familiarity to DoD/DON business practices increases. This behavior allows the large prime to capitalize on limited competition, through typical prime practices.

M. ADP CONTRACTS \$1.00-6.49M SBC PRIME CONTRACTORS

1. Market Summary

The DON spent a total of \$405M on contracts for the ADP market (PSC 7030) where each individual contract was for \$1–\$6.49M (United States Government, 2013). Contracts ranging from \$1–\$6.49M awarded to SBC Prime Contractors in the ADP market accounted for a significant number of the all the awards in this category, however the monetary award for the SBC is minimal. After reviewing the data it is noted that SBC primes accounted for \$55.7M of this award or fourteen percent of the total award. SBC Primes were awarded 1,063 contracts ranging from \$1–\$6.49M in the ADP market for FY12 (United States Government, 2013). Of the 1,063 contracts awarded by the DON to SBC primes in this category 157 of the contracts were awarded to the top five SBC primes (United States Government, 2013). The top five SBC prime contractors were awarded fifteen percent of the total number of awarded contracts by the DON in this category.

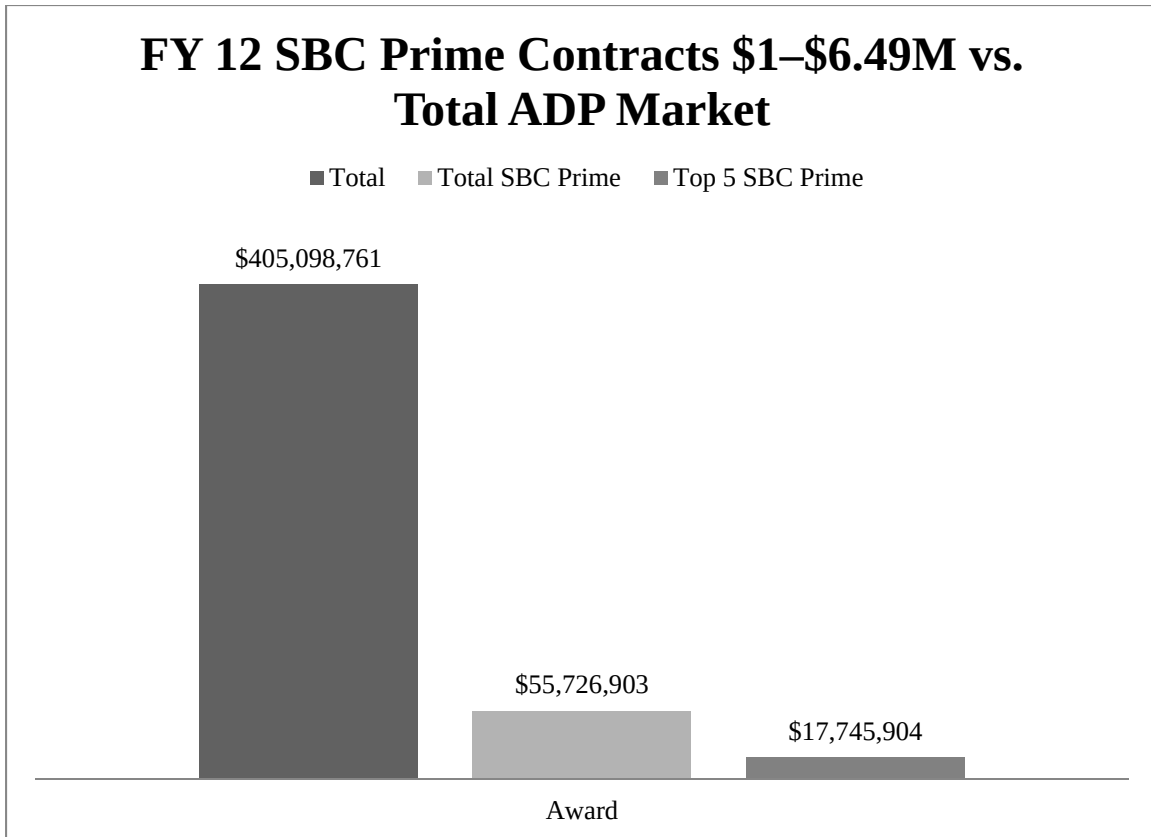


Figure 22. SBC Prime Contracts \$1-\$6.49M vs. Total ADP Market

The top five SBC primes account for \$17.7M of the total SBC prime award for this category and this constitutes thirty-two percent of the eligible monetary award went to the top five companies. The data collected in this section produce results that suggest that a significant portion of the ADP market is consistently awarded to a select few SBC primes. Figure 23 represents the top five awardees as a percentage of the total DON award that went to SBC primes in this category.

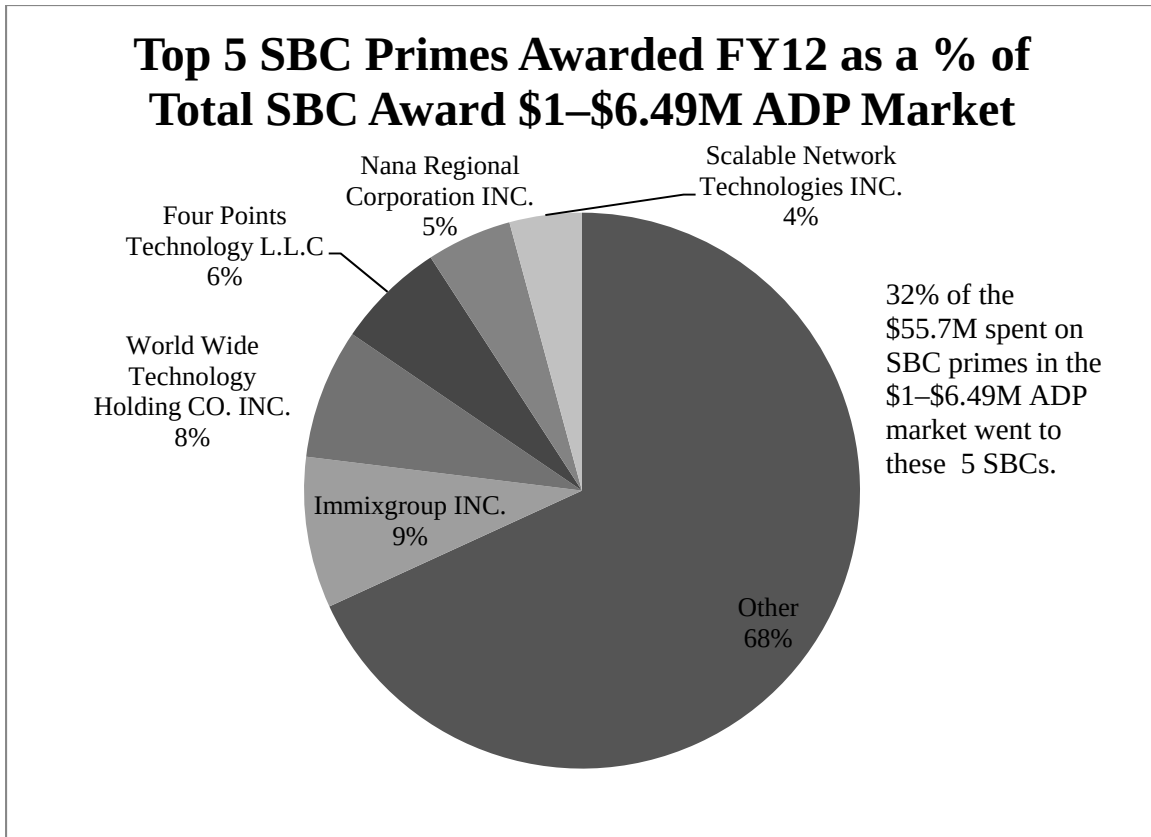


Figure 23. Top 5 SBC Primes Awarded FY12 as a Percentage of Total Award \$1–\$6.49M ADP Market

2. Profiles

The top five companies in this category along with the total dollar amount awarded to each company for FY12 are provided in Table 13. The following section is a brief profile of each company considered to be a top performer for this specific category. The purpose of this section is to highlight certain data in order to establish typical behaviors and business characteristics that are shared by the top performers for this category.

Company	Amount Awarded
Immigroup INC.	\$4,899,272
World Wide Technology Holding CO. INC.	\$4,215,958
Four Points Technology LLC	\$3,521,080
Nana Regional Corporation INC.	\$2,764,528
Scalable Network Technologies INC.	\$2,345,066

Table 13. Top 5 SBC Prime Awarded \$1–\$6.49M ADP Market Amount Awarded

a. Immigroup INC.

Immigroup INC. is classified as a provider of computers, peripherals and software (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Immigroup are \$563.5M for FY12 and Immigroup has 149 employees (Global Duns Market Identifiers, 2012).

Immigroup's total FY 12 Contracts for the ADP Market \$1–\$6.49M was 56 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Immigroup was awarded 319 contracts by the DoD (United States Government, 2013). Immigroup's history with the DoD/DON dates back to 2006 and the annual award total has ranged from \$239.2K in 2006 to \$15.8M in 2012 (United States Government, 2013).

Immigroup is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Immigroup has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Immigroup and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

b. World Wide Technology Holding CO. INC.

World Wide Technology Holding CO. INC. is classified as a provider of computer peripherals, software and business consulting (Hoover's Company Records - In-depth Records, 2013). The reported net sales of World Wide Technology are \$4B for

FY12 and World Wide Technology has 1,008 employees (Global Duns Market Identifiers, 2012).

World Wide Technology's total FY 12 Contracts for the ADP market \$1–\$6.49M was 30 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, World Wide Technology was awarded 1,845 contracts by the DoD (United States Government, 2013). World Wide's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$27.6M in 2000 to \$239.6M in 2012 (United States Government, 2013).

World Wide Technology is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. World Wide Technology has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). World Wide Technology and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

c. Four Points Technology LLC

Four Points Technology LLC is classified as a provider of computer peripherals and software (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Four Points Technology are \$64M for FY12 and Four Points Technology has 28 employees (Global Duns Market Identifiers, 2012).

Four Points Technology's total FY 12 Contracts for the ADP market \$1–\$6.49M was 48 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Four Points Technology was awarded 450 contracts by the DoD (United States Government, 2013). Four Points' history with the DoD/DON dates back to 2004 and the annual award total has ranged from \$235.6K in 2004 to \$23.9M in 2012 (United States Government, 2013).

Four Points is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Four Points has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Four Points and has

consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

d. Nana Regional Corporation INC.

Nana Regional Corporation, INC. is classified as a provider of navigation, oil and gas field services, electrical services and combination utilities (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Nana Regional are \$1.6B for FY12 and Nana Regional has 9,000 employees (Global Duns Market Identifiers, 2012).

Nana Regional's total FY 12 Contracts for the ADP market \$1–\$6.49M was 13 awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Nana Regional was awarded 81 contracts by the DoD (United States Government, 2013). Nana Regional's history with the DoD/DON dates back over a decade and the annual award total has ranged from \$1M in 2000 to \$7.6M in 2012 (United States Government, 2013).

Nana Regional is a recurring DoD/DON contracting partner that does not possess a great deal of intellectual property. Nana Regional has not submitted any patents in the United States in the past 24 months (LexisNexis, 2013). Nana Regional and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

e. Scalable Network Technologies INC.

Scalable Network Technologies, INC. is classified as a provider of computer programming services (Hoover's Company Records - In-depth Records, 2013). The reported net sales of Scalable Network Technologies are \$4.4M for FY12 and Scalable Network Technologies has 43 employees (Global Duns Market Identifiers, 2012).

Scalable Networks' total FY 12 Contracts for the ADP market \$1–\$6.49M was ten awards (United States Government, 2013). Across all markets and DoD agencies, independent of a specific dollar amounts or PSCs, Scalable Network

Technologies was awarded 46 contracts by the DoD (United States Government, 2013). Scalable Network Technologies' history with the DoD/DON dates back to 2008 and the annual award total has ranged from \$550K in 2008 to \$5.6M in 2012 (United States Government, 2013).

Scalable Network Technologies is a recurring DoD/DON contracting partner that possesses minimal intellectual property. Scalable Network Technologies has not submitted any patents in the United States in the past 24 months and one patent total (LexisNexis, 2013). Scalable Network Technologies and has consistently benefitted as evidenced by increasing DoD/DON award totals each year from diversified and prolonged participation in ADP markets.

3. Analysis

a. Design Disclosure Barrier

The SBC prime ADP market where each individual contract was for \$1–\$6.49M suggests that there is a design disclosure barrier that prevents companies that possess intellectual property from participation in this category of the ADP market. Similar to the large primes in this category of the ADP market the SBCs that participate have no reliance on intellectual property. The absence of patents submitted by the SBC in this category is evidence that design disclosure barriers exist and limit competition.

b. Risk Mitigation Barrier

Only two of the five large primes profiled in this category have established relationships with the DoD/DON that have been occurring for a decade and in some cases occurring for decades. This forty percent suggests that there is little evidence of the DON being risk adverse when awarding contracts to SBCs in this category of the ADP market. The DON awarded fifteen percent of the total number of awards and thirty-two percent of the total dollar award to the top five SBC primes. Conversely, all other SBC primes were awarded eighty-five percent of the total number of awards and sixty-eight percent of the total dollar award.

c. *Prime Practices Barrier*

There is evidence in this category of prime practices that could limit competition. The top five SBC primes in this category each experienced increasing award totals over the past decade. This behavior indicates that there is a propensity for SBC primes to consistently seek more contract awards and to be awarded at an increasing rate as the familiarity to DoD/DON business practices increases. However, as with the risk mitigation barrier the diversity in the total awards and amount limit the leverage created by the prime practice barrier in this category of the ADP market. SBCs in this category of the ADP market have a far greater opportunity to displace top SBC primes that have benefited from an increasing annual award due to typical prime practices.

N. SUMMARY

The data presented in this chapter examines trends in DoD/DON contract award behavior to determine if NOA increases participation of the SBC. Data was examined in twelve different combinations; size of the prime contractor, market PSC and price range of the award. The size of the contractor considered in this research was large or SBC prime the size was determined by DoD/DON reporting criteria from www.defense.gov/contracts. In order to compare data collected from two different sources the data collected from www.usaspending.gov was filtered and sorted to provide the researcher with both large and SBC prime data used to compare to the data found on www.defense.gov/contracts. There were three categories of markets analyzed in this research, DON market (all PSCs), NOA market (PSCs 70 and D) and ADP market (PSC 7030). The categories selected provided the researcher with a normal baseline of SBC participation across the entire (all PSC) DON market. This baseline was then compared to NOA (ADP and IT/Telecommunications) markets to establish how NOA policy increases competition through SBC participation. The ADP (software) market was utilized by the researcher to determine if SBCs participated at higher rates than even the NOA market due to the innovative nature of software development and an increased reliance on intellectual property. Small businesses have repeatedly demonstrated a contribution to leading the nation in innovation and driving the economy. (USD [AT

&L], 2010, p. 10). The price ranges of the awards analyzed were based on the DFARS public reporting requirements of contracts of \$6.5M or greater. Research focused on two price ranges, \$6.5M or greater and \$1-6.49M. Analysis of the contract behavior in these ranges helped to determine the current role of the SBC independent of the market PSC, the size of the prime or the price range of the award.

Collective analysis of the three categories revealed trends in contract award behavior as well as provided the researcher with information on the top companies in each category. The information collected on the top companies, included how many patents (intellectual property) the company had claimed, the duration of the companies partnership with the DON as well as trends in annual monetary awards given to the top primes. The summary information also included the size of the prime, the market PSC and the award price range; all of these characteristics were used by the researcher to establish common profiles among the top awardees. These profiles were then used to establish how award behaviors are influenced by the size of the company and the product or service being provided upon award. The profiles provided evidence used to substantiate or refute the entry barriers of design disclosure, risk mitigation and prime practices.

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IV. FINDINGS AND OPTIONS TO FACILITATE SBC PARTICIPATION

A. FINDINGS

In order to fully understand the impact of Naval Open Architecture (NOA) on the role of the small business concern (SBC) the following questions were considered in this research.

- How does the SBC best fit in Department of the Navy (DON), NOA and Advanced Data Processing (ADP) Markets?
- Does NOA encourage SBC participation?
- Does the SBC experience barriers to entry?

1. SBC Participation

Large and SBC prime contractors were considered in this research in order to compare like markets where the only variable was the size of the prime contractor. This strategy allowed the researcher to focus on how the DON award behavior was influenced by the size of the prime contractor. Various markets (DON, NOA and ADP) were used to investigate how DON award behavior is influenced by the product or service being provided by the prime contractor.

Research reveals that large primes were awarded eighty-three percent of all the total awards of the combined DON, NOA and ADP markets and eighty-seven percent of the total monetary award for Fiscal Year 2012 (FY12). This equates to a total award share to the SBC of seventeen percent and a monetary award share of thirteen percent, well below the twenty-two and half percent mandate by the Office of Small Business Programs (OSBP) for 2012. It is also noted that the SBC faces significant obstacles to obtaining contracts in the amount of \$6.5M or greater, research indicates that for contracts of \$6.5M or greater, eighty-eight percent of the DON market, ninety-seven percent of the NOA market and one hundred percent of the ADP market went to large primes. It is clear that the best price range for the SBC to compete is for contracts less than \$6.5M. For contracts ranging from \$1–\$6.49M large primes experienced a decrease in award totals from thirteen to twenty-four percent. The SBC prime experienced an

increase in participation across all three markets when the price range decreased from \$6.5M to \$1–6.49M. The SBC participation increases were significant, in the DON market, SBC participation increased from three to twenty-five percent, the NOA market increased from three to twenty-six percent and the ADP market increased from zero to fourteen percent. Of the twelve market combinations considered, the \$1–6.49M NOA market is the most financially SBC participated market at twenty-six percent of total monetary award, three and a half percent over the OSBP mandate of twenty-two and a half percent. The SBC in the \$1–6.49M NOA market also ranks the highest among the twelve markets in total contracts awarded at thirty-two percent. When compared to the DON and ADP markets this research indicates that NOA has successfully increased participation of the SBC in the NOA \$1–\$6.49M market.

2. Barriers

The use of intellectual property information collected on each company was used to explore the influence of design disclosure barriers and determine whether the design disclosure barrier was a real or perceived barrier to SBC entry to the DON, NOA and ADP markets. This section of the research focused on how many patents each prime contractor had submitted in the past two years. Evidence of patents indicated that the company under analysis possessed some intellectual property and due to becoming a prime contractor, was willing to risk some intellectual property because of design disclosure requirements in order to gain the contract award. Research indicates that seventy-two percent of the large primes awarded a contract in these markets for FY12, regardless of product or service, possessed some intellectual data. The seventy-two percent indicates that among large prime contractors design disclosure, the risk of releasing intellectual property to the DON was symptomatic of doing business with the DON and did not deter participation. When compared to the design disclosure behavior of the large prime the SBC Prime possess a seemingly limited amount of intellectual property. The SBC prime data revealed that only eight percent of the SBC primes awarded a contract in these three markets for FY12 had submitted patents in the past two years. That is a sixty-four percent difference between large and SBC primes. This sixty-four percent suggests that the contracted SBC did not possess intellectual property or that

the SBC that possessed intellectual property was deterred by design disclosure requirements from participating in the DON, NOA and ADP markets. When the same product service code (PSC) and price ranges are considered it was anticipated that the same intellectual property disclosure rate experienced by large primes would be observed when contracting SBC primes. However, due to design disclosure barriers the top SBC primes that are consistently awarded contracts in these markets do not possess intellectual property. In the absence of design disclosure barriers the SBC should produce intellectual property at a rate proportionate with the large prime in the same PSC and award price range. The SBC design disclosure barrier is substantiated due to the very limited intellectual property that the SBC contributes to like markets and award price ranges as the large prime.

The risk mitigation barrier is demonstrated by the DoD/DON through the recurring award behavior to top prime contractors regardless of prime size, market PSC or award price range. Evidence in this research revealed that ninety-three percent of the top large primes awarded a contract FY12 by the DON in ADP, NOA and DON markets had established relationships with the DoD/DON that had existed for ten years or greater. This indicates that the risk mitigation barrier is employed by the DON for large primes; the DON is not encouraging competition in large prime markets due to risk aversion practices that propel the DON to employ the same familiar large primes time and time again. The risk mitigation barrier is further maintained by pointing out that the share of the top large primes for these three markets is fifty-two percent of the monetary award and eighty-three percent of the total contracts awarded

Conversely, when the same variable of risk through recurring relationship was considered, research indicated that top SBC primes experienced more competition in being awarded a prime contract and there was less evidence of a risk mitigation barrier. When compared to the top large primes the top SBC primes with a ten year or greater relationship with the DON is strikingly lower at fifty-seven percent. The lack of a risk mitigation barrier is further supported when the share of the top SBC primes for these markets is twenty-eight percent of the total monetary award and only seventeen percent of the total contracts awarded. The risk mitigation barrier does not apply to the SBC and

is found to be perceived. It is worth mentioning that the risk mitigation barrier heavily applies to the large prime contractor.

The prime practice barrier through evidence of increasing dollar values of previously reported recurring awards to top primes both large and SBC in these three markets was real and substantiated. Ninety-seven percent of the top large primes and eighty-three percent of the top SBC primes considered in this research experienced an increasing financial total of award as successive years of doing business with the DoD/DON past. This behavior can be attributed to the large prime gaining an understanding of DoD/DON contracting practices and subsequently gaining access to previously disclosed intellectual property. Both risk mitigation barrier and design disclosure barrier are elements that contribute to the prime practice barrier. The prime practice barrier is perpetrated by the top primes and perpetuated by the DoD/DON through typical prime practices. This data analysis produced the following evidence of a prime practice barrier; entering FY13 a top FY12 company has a ninety percent chance independent of the size of the company, market PSC or price range of the award to experience an increase in revenue via DoD/DON contracting. This prime practice barrier severely limits increasing competition because there is a finite amount of contracting money to go around. The prime practice barrier is real for the SBC as well as the large prime.

This analysis found that the current best role for the SBC in DON contracting, considering price range and market PSC is the \$1–6.49M NOA market. This research determined that NOA does increase competition in the NOA market \$1-6.49 for the SBC. The study of the data presented in this chapter determined that with respect to the SBC, the design disclosure barrier is real, the SBC risk mitigation barrier is perceived and the SBC prime practice barrier is real.

B. OPTIONS

1. Policy Enforcement and Oversight Reform

Options to facilitate increased SBC competition in DON contracting must start with changes in the organizational culture of the DoD. There is a consistent

underutilization of the SBC across all markets due to a culture that permits SBC exclusion. The 2012 House Committee on Armed Services Panel also found that DoD lacks a culture that fosters small business participation where appropriate (House Committee on Armed Services, 2012, p. 30). The sentiment provided by the House Committee on Armed Services suggests that there is not only a culture that does not encourage SBC participation but there is also a suggestion of the appropriateness of the SBC participation. *Nearly \$300 billion in prime contracts and more than \$200 billion in subcontracting since fiscal year 2009 have been awarded to small bUSInesses by federal agencies* (White House, 2012, p. 28). The SBC is capable of an increased role in prime markets. The DoD/DON must focus on providing the SBC with an increased opportunity to participate in all product PSCs of all markets. The notion that there is appropriateness to the SBC participation encourages the exact culture the House Committee is trying to correct. This research found that there is SBC participation in each of ADP, NOA and DON markets; all but the \$6.5M or greater ADP prime market included the SBC as a prime contractor. This research indicated that the SBC is a viable option in most prime markets, independent of the contract price range or the PSC of the selected market.

The task of changing organizational culture is much easier to suggest than it is to accomplish, however, there are reported weaknesses in contracting behaviors, award monitoring and oversight of policy that the DoD/DON can initially place emphasis on correcting. Concentrating on the oversight of policy enforcement standards that are designed to protect the SBC and diversify market participation should be the catalyst in changing organizational culture. *The acquisition process is often bureaucratic and rigid, with insufficient flexibility to allow appropriate application of management, oversight, and monitoring of small businesses* (House Committee on Armed Services, 2012, pp. 73-74). There must be a concerted effort made by DON contracting officials to properly revise and enforce existing oversight policy designed to protect the interest of the SBC and hold officials accountable. *Congress should consider increasing the DoD's small business prime contract and subcontract procurement goals, and increase accountability in the achievement of the procurement goals* (House Committee on Armed Services, 2012, p. 30). Similar to the actions of the Small Business Administration (SBA), the

DoD/DON must develop new policy that strengthens officials' authority necessary to properly manage SBC participation in various markets. *Working with its federal partners, the SBA has taken multiple steps to strengthen oversight and enforcement to better ensure the benefits of federal small business contracting programs are going only to eligible firms* (White House, 2012, p. 32). Many of the panel participants felt that DoD needs to improve on the monitoring processes of SBC participation (House Committee on Armed Services, 2012, p. 86). The DoD/DON must place emphasis on ensuring the compliance of SBC award monitoring procedures in the FAR and DFARS to confirm that SBCs are being afforded competitive opportunities to perform work. *Therefore, the FAR and DFARS should be reviewed, and clarified if required, to eliminate ambiguity regarding responsibility for ensuring compliance* (House Committee on Armed Services, 2012, p. 31).

It is critical that the DON address the gaps in contracting behaviors, award monitoring and oversight of policy that influences SBC participation prior to attempting to eliminate SBC barriers to entry. Without a cultural reform that fosters an environment that is conducive to protecting the SBC, options to eliminate or alleviate SBC participation barriers are unlikely to make an impact.

2. New SBC Competition Measures

SBC goals are negotiated with the SBA every two years with each federal agency, the SBC prime contracting goal is currently twenty-three percent of all prime contract dollars (House Committee on Armed Services, 2012, p. 13). The current process of a negotiated SBC prime contract as a percentage of dollars does little to ensure that there is SBC competition for any DON contract. The process of determining that twenty-three percent of the prime award dollars will go to an SBC does not deter prime practice barriers that consistently increase dollar awards to recurring top SBC prime providers. The DON must create new competition goals that are focused on encouraging an increase in SBC participation in all prime markets. Prime practice barriers (the propensity for recurring primes to be contracted increasing awards) would be diminished through a spending limit placed on recurring top primes.

A spending cap would prevent the DON from awarding significant increases in the percentage of dollar awards to top recurring primes. Capping the percentage of the increase in the dollar award that a recurring prime can experience would allow more contracting dollars to be distributed to other SBCs in similar markets. The distribution of contracting dollars would cause an increase in SBC competition. This increase in competition would drive down costs through the creation of DON cost leverage and would encourage more innovative SBCs to attempt to win awards.

In addition to a top prime award cap, the DON should explore a diversity quota. This quota would be designed to require contracting officials to spread the total number of the awards as well as the contracting dollars to other eligible SBCs in similar markets. Diversity quotas would ensure that there is fair and balanced spread of opportunity to all eligible participants. The application of a diversity quota would prevent a limited number of top primes from absorbing a majority of the opportunity (total awards and monetary award). An example of this behavior is depicted in this research is the SBC ADP \$1–\$6.49M market that saw thirty-two percent of the monetary award go to the top five SBC primes. When faced with a decision to employ a top prime or miss a diversity quota a contracting official would be implored to contract the SBC that helps attain the diversity quota rather than succumbing to prime practice barriers and choosing the recurring top prime provider.

Additional quota measures to ensure an increase in SBC competition should include a provision in the negotiated goal that sets aside a mandatory percentage of SBC prime awards to new competitors. This quota could be adjusted each year based on the previous year's number of new competitor bids received by the DON from SBCs in specific markets. The new competitor goal should not be static or the same goal across all SBC prime markets, it should vary annually and across all PSCs.

In the event introducing new competition quotas proves too difficult to execute the DoD/DON should at a minimum raise existing competition quotas to reflect the decrease in federal spending that is surely to cut into SBC awards.

Given that federal spending through contracts is expected to decrease, there is a fear that the decrease will be disproportionately borne by small

businesses. To offset the effect of the decline in spending, the small business prime contracting goal should be raised. (House Committee on Armed Services, 2012, p. 13)

An increase in the current SBC prime competition goal would introduce more award dollars to the SBC market. Raising the current SBC prime competition quota could be instituted as early as FY14. A 2012 panel led by the National Economic Council, believes that there recommendations aimed at improving DoD's SBC contracting performance that, if implemented properly, could enable DoD to successfully achieve a goal of greater than twenty-three percent small business participation on all prime contract dollars (White House, 2012, p. 14).

The existing measures of SBC competition are not catalysts to increase SBC competition, although goals are controlled and managed by the DoD/DON and should be used to force an increase in SBC competition. The DON is missing an opportunity to shape the competitive balance of SBC prime markets because of limited existing competition measures that fail to capture relevant data used to indicate an increase of SBC competition. The current system simply measures what percentage of the dollar award went to a SBC. Theoretically one SBC could account for the mandated twenty-three percent of monetary award and SBC competition would be considered adequate. The DoD/DON must introduce new SBC prime competition measures of success in order to increase SBC competition.

3. Strength in Numbers

The DON should investigate possibilities to stimulate growth of collaborative SBC prime contracting groups in an effort to encourage cooperative SBC groups to compete vs. large prime contractors. In addition to increasing competition and expanding opportunities for SBCs, encouraging groups provides for an environment that will accelerate innovation and new solutions and approaches to DoD/DON requirements (Office of Small Business Programs, 2007, p. 9). There is evidence in this research that suggests as SBCs collaborate the award tendency is an increase in both monetary award and the total awards contracted to SBCs. The DON prime market, where contracts awarded for \$6.5M or greater, reflects this award behavior in SBC collaborative groups

increasing an opportunity for an award. Participation for the single source SBC was approximately three percent of the monetary award and eleven percent of the total awarded number, this increased by nine percent of the monetary award and four percent of the total awarded when SBCs collaborated on joint awards (U.S. Department of Defense Office of the Assistant Secretary of Defense [Public Affairs], 2013).

The benefits of SBC collaborative groups could also simulate innovative ideas and solutions. Panel participants noted that most SBCs do not have all the answers, yet they could be successful if they were encouraged to collaborate with other SBCs (House Committee on Armed Services, 2012, p. 86). Increasing collaborative SBC groups would increase SBC competition and permit the DON to maximize on the benefits of decreased cost through cost leverage opportunities as well as capitalize on the innovative nature of the SBC. Encouraging small business teams is one way to increase both competition and SBC participation (Office of Small Business Programs, 2007, p. 7). The SBC greatly increases opportunities for financial growth and becomes much more likely to win prime awards that it would not otherwise have an opportunity to compete for, if the SBC was not in a collaborative environment with other SBCs. *Just as large businesses regularly team in the federal marketplace to achieve certain benefits, small businesses can achieve the same benefits and expand their prime contract (and subcontract) procurement opportunities* (Office of Small Business Programs, 2007, p. 10).

The anticipated result of encouraging SBC collaboration groups ultimately is that DON experiences decreased costs and increases the opportunity to benefit from SBC innovation. The SBC through collaborative groups becomes an increasing threat to compete with large primes for significant contracts.

4. Know the Market

This research indicates that the SBC best participates in the \$1–\$6.49M award price range when compared to the \$6.5M or greater award price range. Independent of the PSC of a market the SBC experienced a twenty percent increase in monetary awards and a twenty-three percent increase in the award total as the amount of the award decreased to 6.49M or less.

The DON must focus efforts on creating more competition for the \$6.5M or greater contract market and maximizing participation in the 6.49M or less award price ranges. This could include SBC collaborative groups as suggested in this research or requiring contract officials to award a fixed percentage of the monetary award as well as the total of the award. The DON could also examine the awards of \$1–\$6.49M to determine what large primes could be eliminated from participation in this price range. According to this research and the markets analyzed, large primes account for ninety-five percent of the monetary award and ninety-four percent of the total number of awards for the \$6.5M or greater markets and seventy-eight percent of the monetary award and seventy-one percent of the total award for the 6.49M or less markets. Eliminating these companies from participating in the 6.49M or less award price ranges would increase competition and opportunities for the SBC prime substantially.

Based on this research for the ADP, NOA and DON markets the best strategy for the SBC prime is to focus on sole source awards that are less than 6.49M and to use collaborative groups to bid on contracts in excess of \$6.5M.

5. Commitment to the Military

It is not until the current culture, policies and typical contracting behavior of the DON is reformed that the SBC will realize substantial increases in the monetary and total prime awards. Therefore it is extremely important for the SBC to attempt to capitalize on and exploit the limited risk mitigation barrier and prime practice barrier that are typically perpetrated by the DON. Contracting officials view SBCs as risky and rather than risk being responsible for a SBC set-aside that might go sour, it is more than attractive to offload that risk to a large prime (Garrett, 2007, p. 12). This research provides amplification on this sentiment and recognizes that the DoD/DON's typical behavior is to employ the large prime; however, this research goes on to suggest that this behavior also applies to top SBC primes. Top SBC primes are deemed by the DoD/DON through a limited risk mitigation barrier to be less risky than a SBC that is not a top prime provider.

To exploit what is described as a limited risk mitigation barrier the SBC should consider a practice of limiting initial award total and dollar expectations and simply bid

to win any award and initiate a relationship with the DoD/DON. A participant in a 2012 House Committee on Armed Service panel stated that it is hard for the SBC to get in the door (House Committee on Armed Services, 2012, p. 89). This research indicates that fifty-six percent of the SBCs awarded contracts in the ADP, NOA and DON markets for Fiscal Year 2012 (FY12) had been awarded a contract for a minimum of ten consecutive years by the DoD/DON. This behavior suggests that the SBC need only get a single contract and there is a better than fifty percent chance that in ten years the contracted SBC would still be in business with the DoD/DON.

The SBC should also attempt to capitalize on the prime practice barrier that is overwhelmingly made obvious in this research. The prime practice barrier indicates that the DoD/DON has increased or maintained the monetary award of eighty-three percent of the top SBC prime contractors over the course of the SBC's relationship with the DoD/DON. From the same 2012 House Committee on Armed Services panel that suggested it was difficult for the SBC to get an opportunity to participate in federal contracting; another panel member said contracting officials tended toward "sole-source for life" approaches to procurement (House Committee on Armed Services, 2012, p. 103). SBCs would be wise to simply get its foot in the door and wait its turn in order to experience increased award total and revenue.

6. Reporting Regulations

Defense Federal Acquisition Regulation Supplement (DFARS) subpart 205.303, Announcement of Awards, paragraph a, section 1, revised 2010, requires that the DoD report all contractual actions, including modifications, which have a face value, excluding unexercised options, of more than \$6.5M are reported daily via a public announcement (Department of Defense, 1998, pp. 205.3-1). This regulation should be reformed to include all contractual actions of any face value. Removing all public reporting barriers, specifically for contracts from \$1–\$6.49M and requiring public disclosure (as is currently the practice with contracts of \$6.5M or greater) would place contracting officials and agencies under increased scrutiny. This type of open disclosure would encourage independent research by small business experts and advocates who reside outside the

influence of the federal government to determine the current and potential utilization of the SBC in DON contracting activities. Autonomous research should be used to establish reasonable expectations in SBC participation and in shaping policy that directs DoD/DON contracting behaviors. A one hundred percent reporting policy on all transactions builds an accurate database for the DON to display the real opportunity for SBC, creating the ability to refute claims of barriers to enter federal markets that limit SBC participation using quantifiable data.

7. Intellectual Property Protection

There is continuing discussion on intellectual property rights and DoD policy from within the Federal Government that suggests problematic practices on the DoD's use of intellectual property. The DoD IG should assess the degree to which DoD observes the restrictions in existing law and policy related to use, disclosure, or release of intellectual property (House Committee on Armed Services, 2012, p. 74). This data collected in this research along with panel testimony substantiates the claim that the SBC is deterred by design disclosure barriers.

A member of a 2012 House Committee on Armed Services Panel stated that large primes do not want SBCs to innovate and another panel member stated that anyone that wants to do business with you wants your technology. Both agreed that more needs to be done to protect the intellectual property of small businesses. (House Committee on Armed Services, 2012, p. 100)

The analysis conducted in this research specifies that there is a sixty-four percent difference between large and SBC primes participating in the same markets, for similar contracts, in the submission of patents to protect intellectual property. The DoD/DON must take action to breakdown the design disclosure barrier that limits SBC participation in contracting opportunities in order to maximize the impact of the innovative nature of the SBC. The SBC is presently providing the products and solutions needed to support Sailors and Marines, and can provide the innovations necessary to help solve life cycle sustainment problems (Dussault, 2012, p. 13).

A potential option to facilitate SBC participation in NOA and DON markets is to permit SBCs to retain intellectual property indefinitely so long as the SBC is considered a

viable provider of a service or product. Allowing the SBC to retain its intellectual capital throughout the course of what this research suggests is typically a recurring and lengthy association with the DON (once an initial contract is awarded) would increase competition via increased SBC participation due to increased protection of SBC intellectual property. *Smaller businesses can experience particular difficulties in protecting their rights because of their size and the comparatively limited resources available to them* (House Committee on Armed Services, 2012, p. 63).

Permitting indefinite SBC ownership of intellectual property should exist as long as the SBC is considered viable by an independent panel. In the event the independent panel determines that the SBC is no longer a viable provider, a provision in the contract would allow the failed SBC (that can no longer provide the original product or service requiring the use of its intellectual property) to select a replacement. This replacement could be an offshoot of an existing company, partnership or collaborative team member in an effort to allow the original SBC to retain some control over the resting place of its intellectual property. This provision would be used to encourage an increase in the initial SBC competitive bidding process aimed at maximizing the innovative contribution of the SBC and to maximize the obvious benefits to the DON through increased SBC participation.

C. SUMMARY

Of the twelve distinct markets reviewed in this research it is found that the SBC best performs in the NOA \$1–\$6.49M market. This market includes all information technology (IT) and telecommunications (TELECOM) contracts for FY12. Based on the analysis and data collected in this research it is the recommendation that NOA does increase competition via the SBC for IT and TELECOM markets. Despite findings that suggest NOA policy is delivering on its principle to increase SBC competition there is room for improvement.

Analysis of existing literature and collected data in this research substantiate that some barriers of SBC participation in DON contracting opportunities exist. Research suggests that the barriers created by typical prime practices and design disclosure

requirements impact the SBC's ability to maximize competitive participation for DON, NOA and ADP contracts. These barriers are present in both award price ranges (\$1–\$6.49M and \$6.5M or greater) examined by this research. The risk mitigation barrier is refuted as this research indicates that the risk mitigation is most prominently practiced in the large prime sector of the market. There was little evidence found in this research to suggest that the SBC has to endure risk mitigation barriers to entry.

Based on existing literature and the analysis of the data collected in this research, seven options to facilitate SBC participation in DON contracting were presented. The options were derived from and focused on the most reported on (from existing literature) and data determined barriers (from analysis) that exist for the SBC. Options ranged from general policy and oversight reform to the specific intellectual property options designed to increase the opportunity for the SBC. The options provided to facilitate SBC participation were designed to force DON policy and quotas to encourage participation and to inspire the SBC to want to increase participation through more SBC friendly practices and policy changes.

V. CONCLUSION AND RECOMMENDATIONS FOR FUTURE RESEARCH

A. CONCLUSION

The purpose of this research was to better to understand the relationship between Department of the Navy (DON) contracting behavior, Naval Open Architecture (NOA) policy and the role that the small business concern (SBC) in various product service codes (PSC), specifically to find out if NOA does increase competition via the SBC. The objective of this research was to understand if the SBC barriers to entry reported in existing literature were real (instituted by the DON) or perceived (by the SBC). Through data analysis pertinent options to overcome reported obstacles that the SBC encounters in the DON market place were derived. These options were generated in an attempt to maximize DON benefits that have been articulated through existing NOA literature. The DON benefits that are consistently attributed to increased SBC participation are decreased cost and growth in innovation.

Fiscal Year 2012 (FY12) DON spending data was used to construct DON contracting trends that led to options to facilitate an increase in SBC participation in variety of markets. In an effort to understand typical DON contracting behaviors across all products or services, awarded by the DON, this research focused on multiple PSCs and award price ranges. The variation in size of the prime contractor, prime characteristics, the PSC and the award price range were critical in establishing typical DON contracting behaviors. These behaviors were then used to compare and contrast how NOA policy impacted SBC participation in information technology (IT) and telecommunications (TELECOM) markets, categorized in this research as the NOA market.

Through analysis of DON spending data, recurring prime awardee profiles, various PSCs and award price ranges; SBCs along with the DON will be better equipped to utilize and understand the reasoning for the options presented in this research. The options presented in this research are designed to facilitate SBC participation and to encourage the DON to capitalize on benefits that are offered by the SBC. This research

contained a review of existing literature and analysis of collected data used to derive options to facilitate SBC participation and in order to answer the research questions presented in the introduction.

1. Does NOA increase SBC participation?

Analysis of the ADP, NOA and DON markets indicates that of the various combinations of PSCs, award price ranges and size of the prime contractor examined the best performance of the SBC prime was in the \$1–\$6.49M NOA market. The NOA market for this research was considered to include PSCs 70 and D. PSC 70 is assigned to advanced data processing (ADP) and D is assigned to information technology (IT) / telecommunications (TELECOM). The SBC in the \$1–\$6.49M NOA market realized twenty-six percent of the total monetary award and thirty-two percent of the total number of awards given out by the DON, the highest percentage of any studied category. SBC participation at the twenty-six percent rate of the monetary award was not only the highest percentage of the award of the various PSCs and award price ranges analyzed; but the twenty-six percent surpasses the FY12 mandated twenty-two and a half percent of total prime monetary award to the SBC. This research finds that NOA policy does increase SBC participation and that the propensity of SBC participation in \$1–\$6.49M NOA markets is greater than the propensity of the SBC participation in all other considered markets.

2. Where does the SBC best participate in DON contracting?

Research indicates that the SBC faces significant obstacles to obtaining contracts in the amount of \$6.5M or greater. Found in this research, contracts of \$6.5M or greater eighty-eight percent of the DON market, ninety-seven percent of the NOA market and one hundred percent of the ADP market went to large primes. Under the current policy and DON contracting behaviors it is resoundingly clear that the SBC best competes in the \$1–\$6.49M award price range. Analysis reveals that for contracts ranging from \$1–\$6.49M large primes experienced a decrease in award totals from thirteen percent in DON markets, twenty-four percent in NOA markets and fourteen percent in ADP markets. The SBC prime experienced an increase in participation across all three markets

when the price range decreased from \$6.5M to \$1-6.49M. The SBC participation increases were significant, in the DON market, SBC participation increased from three to twenty-five percent, the NOA market increased from three to twenty-six percent and the ADP market increased from zero to fourteen percent. The NOA market independent of the award price range yields the highest percentage of monetary award to the SBC at combined twenty-nine percent. This indicates to SBCs that the most money, hence the best opportunity available to the SBC is in ADP, IT and TELECOM (NOA market).

3. Are the barriers to SBC participation real or perceived?

Three barriers to SBC participation were developed and examined in this research. From existing literature there were a number of barriers discussed, however, there were recurring practices and examples that led to this research to develop the barriers of design disclosure, risk mitigation and prime practices.

The design disclosure barrier is described as a barrier due to DON design disclosure policy that limits SBC participation. The limited SBC participation attributed to the design disclosure barrier is realized through a process of self-elimination that the SBC participates in to protect disclosure of its intellectual property.

This research focused on the use of intellectual property in the form of patents. Information collected on each prime contractor was used to explore the effect of design disclosure barriers on the SBC and to determine if the design disclosure barrier was a real or perceived barrier to SBC participation. Research considered how many patents each prime contractor had submitted in the past two years. The research used evidence of patents as an indication that the company under analysis possessed some intellectual property, and due to becoming a prime contractor, was willing to risk some intellectual property due to design disclosure requirements.

Seventy-two percent of the large primes awarded a contract in the ADP, NOA and DON markets regardless of product or service, possessed some intellectual data via a patent. The seventy-two percent indicates that among large prime contractors design disclosure was merely a typical and anticipated cost of doing business with the DON.

SBC prime data discloses that eight percent of the SBC primes awarded a contract in these three markets for FY12 had submitted patents in the past two years, a sixty-four percent difference between large and SBC primes. This sixty-four percent suggests one of two justifications for the lack of SBC intellectual property, the SBC prime does not possess intellectual property or that the SBC that possesses intellectual property is deterred by design disclosure requirements from participating in DON contracting.

Considering the same PSC and award price ranges it is anticipated by logical observation that the same intellectual property disclosure rate experienced by large primes would be observed when contracting SBC primes. However it is determined by this research that due to design disclosure barriers the top SBC primes in these markets do not possess intellectual property and those companies that do possess intellectual property choose not to participate in DON contracting.

The risk mitigation barrier is demonstrated in this research through the recurring award behavior of top prime contractors regardless of prime size, market PSC or award price range. When practiced, risk mitigation barriers diminish competition opportunities for both large and SBC primes, independent of the PSC or price range of the award. Data collected on each of the large prime companies examined in this research revealed that ninety-three percent of the top large primes awarded in FY12 through DON contracting had persistent dealings with the DoD/DON that have endured for over a decade. The propensity for the DoD/DON to contract for prolonged periods indicates that there is risk mitigation barrier employed by the DON for large primes. This research indicates that the DON is not encouraging competition in large prime markets due to risk aversion practices.

On the other hand when the same element of risk mitigation through recurring relationships is measured for top SBC primes research indicates that SBC primes experience more competition and there is less evidence of a risk mitigation barrier. Compared to the top large primes the top SBC primes with a decade or greater recurring relationship with the DON is lower at fifty-seven percent. The absence of a risk mitigation barrier is further supported when the portion of the top SBC primes award for FY12 is considered. The SBC portion of the monetary award in FY12 was twenty-eight

percent of the total monetary award and only seventeen percent of the total contracts as compared to eighty-three percent and fifty-two percent for the large prime. This research indicates the risk mitigation barrier does not apply to the SBC and is found to be perceived.

The prime practice barrier was derived by this research through evidence of the increasing dollar amount of awards that are consistently given to top recurring large and SBC primes. This research found that ninety-seven percent of the top large primes and eighty-three percent of the top SBC primes experienced an increasing financial total of award as each consecutive year of doing business with the DON past. This conduct is accredited to the top primes gaining familiarity of contracting practices and consequently gaining access to previously disclosed intellectual property. Both risk mitigation barrier and design disclosure barrier are elements that contribute to the prime practice barrier. The prime practice barrier is executed by the top primes and maintained by the DON through typical prime practices. Data from this research produces the following evidence of a prime practice barrier; entering FY13 a top FY12 company had a ninety percent chance independent of the size of the company, market PSC or price range of the award to experience an increase in revenue via DoD/DON contracting. This prime practice barrier severely limits increasing competition because there is a finite amount of contracting money to be dispensed. The prime practice barrier was found real and substantiated by this research.

4. What options are needed to facilitate SBC participation?

Founded on prevailing literature and the examination of the statistics composed in this research seven options to facilitate SBC participation in DON contracting were offered. The options were the result of a focus placed on the most reported on description of barriers and this data used to substantiate or refute entry barriers believed to occur most frequently for the SBC. Options ranged from overall strategy and enforcement reform to the precise intellectual property options calculated to increase the prospects of participation for the SBC. The options provided to facilitate SBC

participation were designed to force DON policy and quotas to encourage participation and to motivate the SBC to increase participation through more SBC friendly practices and strategy modifications.

B. RECOMMENDATIONS FOR FUTURE RESEARCH

This research focused on large and SBC prime contractors in an effort to investigate typical DON contracting behaviors and determine how NOA policy influenced these behaviors. The data collected on the prime contracts and prime contractors in this research was used to establish baselines of SBC participation in various markets as a prime provider vs. large prime provider participation in the same markets. The data collected on the SBC and large prime contractors was then compared and used to refute or substantiate barriers reported in existing literature. This research was limited in this study to prime contractors in an attempt to consider the SBC free from large prime influence. This research attempted to eliminate as much extraneous influence experienced by the SBC in DON contracting as possible in an effort to capture data that would suggest real SBC barriers to entry. The most efficient way to accomplish an autonomous view of the SBC in DON contracting was to focus on prime contracts.

Future research should consider large and SBC sub-contractor data collected from the same ADP/NOA/DON markets and the same award price ranges. Collecting the same data from the same sources and only changing the variable of prime contracts vs. sub-contracts will either provide further support of the barriers reported in this research or prove that the trends and obstacles found in this research do not apply to sub-contract markets. In the event the sub-contract data refutes the findings in this research new sub-contractor barriers to entry of the DON contracting market will surface as a result. Using new found sub-contractor barriers, options to facilitate SBC sub-contractor participation could be generated. Just as in this research, any sub-contractor options should aim to maximize the mutual benefit of association between the DON and increasing SBC participation as sub-contractors.

Studying the prime or sub-contract behavior in the Department of the Army (DOA) and Department of the Air Force (DOAF) will reveal trends in contracting

behavior in other branches that could be used to improve DON contracting behaviors focused on maximizing the innovative capacity of the SBC. Future research could also consider how other federal agencies compare to the entire DoD. A study that compares SBC contracting data from disparate federal agencies may possibly encourage the distribution of successful lessons learned among agencies as it pertains to SBC utilization. Examining other federal departments might prove to be a catalyst to SBC quota reform throughout the government. Quota reform could be based on certain agencies or departments' propensity to employ the SBC; these findings could also be used to answer the question of whether or not the DoD/DON is doing enough to employ the SBC in contracting opportunities.

Selecting a single PSC and studying every company awarded a contract for in a given FY would provide further granularity on how SBCs contribute intellectual property to the DON. This data could be used to clarify and establish expectations of the SBCs role in providing innovation through intellectual property to the DON. An additional benefit of studying all awardees vs. just the top awardees would determine if intellectual property is being contributed by the SBC as a whole at a rate more substantial than that of the large corporation population.

This research was limited to the study of a single FY. Collecting data for multiple FYs would provide an increased understanding of DON contracting behaviors, SBC participation in various markets, award price ranges, possible SBC barriers to entry and the historical influence of NOA and the role of the SBC in DON contracting.

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